IN THE

Supreme Court of the United States

OCTOBER TERM, A. D. 1936.

No. _____

THE MANTLE LAMP COMPANY OF AMERICA,
Petitioner,

vs.

ALUMINUM PRODUCTS COMPANY, A CORPORATION,
Respondent.

ON WRIT OF CERTIORARI TO THE UNITED STATES CIRCUIT COURT OF APPEALS FOR THE SEVENTH CIRCUIT.

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IN THE

United States Circuit Court of Appeals

For the Seventh Circuit

No. 5412

THE MANTLE LAMP COMPANY OF AMERICA,
Appellant,

vs.

ALUMINUM PRODUCTS COMPANY, A CORPORATION,
Appellee.

Counsel for Appellant:
MR. GEORGE I. HAIGHT,
MR. W. H. F. MILLAR,

Counsel for Appellee:
MR. WILLIAM NEVARRE CROMWELL.

Appeal from the District Court of the United States for the Northern District of Illinois, Eastern Division.

TRANSCRIPT OF RECORD FILED DEC. 29, 1934.
PRINTED RECORD.

IN THE

United States Circuit Court of Appeals

For the Seventh Circuit

No. 5412

THE MANTLE LAMP COMPANY OF AMERICA,
Appellant,

vs.

ALUMINUM PRODUCTS COMPANY, A CORPORATION,
Appellee.

---

ounsel for Appellant:
MR. GEORGE I. HAIGHT,
MR. W. H. F. MILLAR,

Counsel for Appellee:
MR. WILLIAM NEVARRE CROMWELL.

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1 Pleas in the District Court of the United States for the Northern District of Illinois, Eastern Division, begun and held at the United States Court Room, in the City of Chicago, in said District and Division, before the Honorable John P. Barnes, District Judge of the United States for the Northern District of Illinois on Thirtieth day of July, in the year of our Lord one thousand nine hundred and Thirty-four, being one of the days of the regular July Term of said Court, begun Monday, the Second day of July, and of our Independence the 158th year. Placita.

Present:

Honorable John P. Barnes.
William H. McDonnell, U. S. Marshal.
Charles M. Bates, Clerk.

2 IN THE DISTRICT COURT OF THE UNITED STATES,

Northern District of Illinois,

Eastern Division.

The Mantle Lamp Company of America, a corporation,
Plaintiff,
vs.
Aluminum Products Company, a corporation,
Defendant.
} No. 12573

Be It Remembered, that the above-entitled action was commenced by the filing of the following Bill of Complaint in the above-entitled cause in the office of the Clerk of the District Court of the United States for the Northern District of Illinois, Eastern Division, on this the 21st day of November, 1932.

Nov. 21. 3 IN THE DISTRICT COURT OF THE UNITED STATES.

• • (Caption) • •

BILL OF COMPLAINT.

To the Honorable, the Judges of the United States District Court, for the Northern District of Illinois, Eastern Division:

The Mantle Lamp Company of America, a corporation, brings this, its Bill of Complaint, against the Aluminum Products Company, a corporation, and says:

1. That the plaintiff, The Mantle Lamp Company of America, is a corporation duly organized and existing under and by virtue of the laws of the State of Illinois and having its principal office and place of business in Chicago, in said State.

2. That the defendant, Aluminum Products Company, is a corporation organized and existing under and by virtue of the laws of the State of Illinois and is a citizen and in-

4 habitant of the State of Illinois, with a place of business at Lemont, Illinois, within the said Northern District of

Illinois, Eastern Division, wherein it committed the acts of infringement hereinafter complained of.

3. That the jurisdiction of the court depends upon the Patent Laws of the United States.

4. That heretofore, on to-wit: October 29, 1919, Lewis Van Deventer Blair, a citizen of the United States, residing at Chicago in the State of Illinois, was the first, true and original inventor of a certain new and useful improvement in Heat-Insulated Receptacles, not known or used in this country and not patented or described in any printed publication in this or any foreign country before his said invention or discovery thereof and not more than two years prior to his hereinafter recited application for a patent therefor and not in public use or on sale for more than two years prior to his hereinafter recited application for a patent therefor, and no application for a foreign patent for said invention was filed more than twelve months prior to the filing of the application in this country, and said invention was not abandoned to the public.

5. That said Lewis Van Deventer Blair being, as aforesaid, the original, first and true inventor of said improvements, within the meaning of the Statutes of the United States then in force and being entitled to a patent thereon under the provisions of said statutes, did file in the United States Patent Office an application for Letters Patent on said invention and on the 14th day of November, 1922, all of the requirements of the statutes of the United States then in force having been duly complied with, Letters Patent of the United States No. 1,435,199 were duly issued on said application to The Mantle Lamp Company of America, a corporation of Illinois, to whom the said invention and said application for Letters Patent thereon had previously been duly assigned by an instrument in writing, duly executed and delivered by said Lewis Van Devanter Blair, and recorded in the Patent Office of the United States.

6. That plaintiff has expended large sums of money in making the invention of said Letters Patent profitable to itself and useful to the public; that said invention has been and is of great benefit and advantage to the public and the public have generally acknowledged and acquiesced in the rights of plaintiff thereunder, and that a large number of devices embodying the invention of said Letters Patent have been made and sold by the plaintiff.

7. That the said defendant has infringed upon said Let-

ters Patent since the date of said Letters Patent and prior to the filing of this bill, by making or causing to be made, using or causing to be used, and selling or causing to be sold, within this district and elsewhere in the United States, heat-insulated receptacles made in accordance with and embodying the invention set forth in the said patent, willfully and without the consent of the plaintiff and is continuing to do so, and has derived unlawful gains and profits from such infringement which the plaintiff would otherwise have received but for such infringement and has thereby been caused irreparable damage.

6 8. That the plaintiff has given to the public notice of the aforesaid Letters Patent and the plaintiff's rights thereunder, by marking the receptacles manufactured by it under said Letters Patent in accordance with the statute in such cases made and provided.

9. That in the month of December 1927 and prior thereto, The Geo. H. Bowman Company, a dealer in heat-insulated receptacles and other commodities in the City of Cleveland, State of Ohio, was vending and selling heat-insulated receptacles embodying the invention set forth in and in infringement and violation of the rights of plaintiff under said Letters Patent No. 1,435,199; that on the 18th day of January, 1928, the said The Mantle Lamp Company of America, brought its bill in equity in the District Court of the United States, for the Northern District of Ohio, Eastern Division, against the said, The Geo. H. Bowman Company, and in said suit complained that the defendant had infringed and threatened the further infringement of the said Letters Patent No. 1,435,199; that the said defendant filed its answer to the said bill of complaint and the said cause came on to be heard on the pleadings and proofs and was argued before the Honorable S. H. West, Judge of the said District Court; and on the 12th day of September, 1929, the court ordered a decree for the defendant and against the plaintiff and denying the validity of the said Letters Patent No. 1,435,199 for want of

7 invention; that thereafter and on the 19th day of November 1929 the plaintiff prayed an appeal from the said decree of the District Court to the United States Circuit Court of Appeals for the Sixth Circuit and filed therein its assignment of errors; that thereafter the said cause came on to be heard before the Judges of the United States Circuit Court of Appeals for the Sixth Circuit, upon the record, briefs and arguments of counsel and that upon consideration of the

proofs, briefs, and arguments the Circuit Court of Appeals for the Sixth Circuit, in an opinion filed November 3, 1931, reversed the finding of the District Court and remanded the said cause to the said District Court with instructions to enter a decree affirming the validity of the said Letters Patent No. 1,435,199, and finding that the defendant had infringed claim one (1) of said patent and without prejudice to any rights of the plaintiff under any other claim, and that a perpetual injunction, as prayed for, restraining the defendant from infringing said Letters Patent issue and said decree was accordingly thereafter signed and filed in the said District Court on the 11th day of May, 1932, and the said perpetual injunction was thereupon ordered to be granted and issued.

10. Wherefore, plaintiff prays for a preliminary injunction, pending this suit, and for a permanent injunction issuing out of and under the seal of this court, enjoining and restraining the said defendant, the Aluminum Products Company, a corporation, its officers, directors, solicitors, clerks, servants, agents, attorneys, and workmen, and each of them, from infringing upon said Letters Patent; that the defendant account to the plaintiff for the profits made by it and for
8 the damages sustained by the plaintiff; that plaintiff recover the costs and disbursements of this suit, and plaintiff prays for such other and further relief as may appear proper and be agreeable to equity; that a writ of subpoena may be issued under the seal of this court directed to the above named defendant, Aluminum Products Company, a corporation, commanding it to appear and answer this bill of complaint, but not under oath the answer under oath being hereby expressly waived.

THE MANTLE LAMP COMPANY OF AMERICA,
By VICTOR S. JOHNSON,
President.

State of Illinois, }
County of Cook. } ss.

Before me, the undersigned, a Notary Public in and for the county and State aforesaid, this 7th day of September, A. D. 1932, personally appeared Victor S. Johnson, and made oath that he is President of The Mantle Lamp Company of America, the plaintiff named in the foregoing bill; that he has read the said bill, knows the contents thereof, and that

the same is true as he verily believes, except as to such matters as are alleged upon information and belief and as to those matters he verily believes them to be true; that he subscribed to the foregoing bill and that he had authority so to do.

Witness my hand and Notarial Seal the day and year aforesaid.

H. M. JUNKER,
Notary Public.

(Seal)

My Commission Expires Oct. 2, 1932.

GEORGE I. HAIGHT,
W. H. F. MILLAR,
Solicitors for Plaintiff.

Dec. 24. 9 And on, to wit, the 24th day of December, 1932 came the Defendant by its attorneys and filed in the Clerk's office of said Court a certain Motion to Dismiss in words and figures following, to wit:

10 IN THE DISTRICT COURT OF THE UNITED STATES.

* * (Caption) * *

MOTION TO DISMISS.

Now comes Aluminum Products Company, a corporation, the defendant in the above entitled suit and moves the court to dismiss the bill of complaint filed in the above entitled cause, upon grounds and reasons therefor, as follows:

—1—

Because this cause of action is based solely upon a patent, viz. Blair patent No. 1,435,199 granted November 14, 1922, which said patent on May 28, 1927 was decreed to be invalid by the United States Circuit Court of Appeals for the Seventh Circuit, in *Monarch Company, Inc.* and *Therm-A-Jug Company, Inc.* v. *Mantle Lamp Company of America* (the plaintiff herein) Docket No. 3889 and reported in 22 F. (2nd) 95, in which rehearing was denied December 5, 1927.

11 —2—

Because the United States Circuit Court of Appeals for the Seventh Circuit in the case of *Monarch Company, Inc.*, v. *The Mantle Lamp Company of America* (the plaintiff herein) Docket No. 4012 (not reported) again found Blair patent 1,435,199 invalid and issued its mandate to the District Court of the Northern District of Illinois, Eastern Division, on October 8, 1928 to enjoin the plaintiff herein from further prosecuting a suit which it had brought in the United States District Court at Kansas City and from bringing or prosecuting any other suits under Blair patent 1,435,199 against the Monarch Company's customers, jobbers, dealers, agents and distributors at any time or place.

—3—

Because this cause of action is based solely upon a patent, viz. Blair patent No. 1,435,199 granted November 14, 1922, which said patent is wholly invalid inasmuch as no disclaimer has been made as required in Sections 65 and 71, Title 35 U. S. Code, (Revised Statutes Sections 4917 and 4922) as to claims 1, 4, 5, 6, 7, 10, 11, 12, 13, 14, 17, 18, 21, 22, 23, 24 of said Blair patent 1,435,190 which were held invalid by the United States Circuit Court of Appeals for the Seventh Circuit on May 28, 1927, in the case of *Macon Mfg. Co.* v. *Mantle Lamp Company of America* (the plaintiff herein) Docket No. 3812, reported in 22 F. (2nd) 93. in which case rehearing was denied by said Circuit Court of Appeals on December 5, 1937.

—4—

Because the plaintiff Mantle Lamp Company of America has in its bill of complaint disregarded and failed to set
12 forth and inform this court concerning the following litigation in the United States Circuit Court of Appeals for the Seventh Circuit and the Supreme Court of the United States involving the Blair patent 1,435,199:

1. The decision of the United States Circuit Court of Appeals for the Seventh Circuit in the contested case of *Macomb Mfg. Co.* v. *Mantle Lamp Company of America*, Docket No. 3812, reported in 22 F. (2nd) 93, in which all of the claims of the Blair patent 1,435,199 that were relied upon in said case,

namely claims 1, 4, 5, 6, 7, 10, 11, 12, 13, 14, 17, 18, 21, 22, 23, 24, were declared invalid.

2. The decision of the United States Circuit Court of Appeals for the Seventh Circuit in the contested case of *Monarch Company Inc., and Therm-A-Jug Company, Inc.* v. *Mantle Lamp Company of America*, Docket No. 3889, reported in 22 F. (2nd) 95, in which the Blair patent 1,435,199 was declared invalid.

3. The decision of the United States Circuit Court of Appeals for the Seventh Circuit in the contested case of *Monarch Company, Inc.*, v. *Mantle Lamp Company of America*, Docket No. 4012, (not reported) in which the Blair patent 1,435,199 was declared invalid and an injunction decreed against the Mantle Lamp Company of America (the present plaintiff) to refrain from prosecuting and bringing suits on said Blair patent.

4. The decision of the United States Supreme Court
13 in the case of *The Mantle Lamp Company of America, Petitioner*, v. *The George H. Bowman Company, Respondent*, Docket No. 673, reported in 285 U. S. 545, in which the Supreme Court denied the petition of The Mantle Lamp Company of America, for a writ of certiorari to the United States Circuit Court of Appeals for the Sixth Circuit to review the decision of that court in which claim 1 of Blair patent 1,435,199 was held valid, said suit not having been contested, the decision of which is reported in 53 F. (2nd) 441, and which suit has been referred to in the bill of complaint herein, the ground upon which said writ of certiorari was prayed being that the decision of the Circuit Court of Appeals for the Sixth Circuit was in conflict with the decision of the Circuit Court of Appeals for the Seventh Circuit in the case of *The Mantle Lamp Company of America* v. *Macomb Manufacturing Company*, 22 F. (2nd) 93.

EUGENE M. GILES,
HARVEY S. HANSON,
Solicitors for Defendant.

14 And on, to wit, the 21st day of January, 1933 came the parties by their attorneys and filed in the Clerk's office of said Court a certain Stipulation in words and figures following, to wit:

15 IN THE DISTRICT COURT OF THE UNITED STATES. Filed Jan. 21 1933.

* * (Caption) * *

STIPULATION.

In accordance with the oral stipulation made by the solicitors appearing for the respective parties herein, in open court at the argument before the Honorable George E. Q. Johnson, United States District Judge, on Wednesday, January 19, 1933, in connection with plaintiff's motion for a preliminary injunction,

It is hereby stipulated and agreed by and between the parties hereto by their respective solicitors that the following matters relating to prior litigation in the United States Circuit Court of Appeals for the Seventh Circuit and the United States Supreme Court are admitted by the plaintiff herein:

1. The plaintiff herein, The Mantle Lamp Company of America is the same The Mantle Lamp Company of America which was a party in the case of Macomb Mfg. Company, appellant-defendant, *vs.* The Mantle Lamp Company of America, appellee-plaintiff, in the United States Circuit Court of Appeals for the Seventh Circuit, which case was docketed in said court as No. 3812, that in said case the Blair patent No.

16 1,435,199 granted November 14, 1922, which is the patent in suit herein, was held to be invalid as to claims 1, 4, 5, 6, 7, 10, 11, 12, 13, 14, 17, 18, 21, 22, 23 and 24 by said United States Circuit Court of Appeals for the Seventh Circuit in its opinion dated May 28, 1927, in which case rehearing was denied by said United States Circuit Court of Appeals for the Seventh Circuit on December 5, 1927, that said opinion of said Circuit Court of Appeals for the Seventh Circuit is as reported in 22 Federal Reporter (2nd) 93, and that following denial of rehearing of said cause on December 5, 1927, the United States Circuit Court of Appeals for the Seventh Circuit in said case No. 3812, forthwith issued its mandate and the bill of complaint was thereupon promptly dismissed and the cause thereby finally concluded.

2. The plaintiff herein, The Mantle Lamp Company of America is the same The Mantle Lamp Company of America which was a party in the case of Monarch Company, Inc., and Therm-A-Jug Company, Inc., appellants-plaintiffs, *v.* The Mantle Lamp Company of America, appellee-defendant, in the United States Circuit Court of Appeals for the Seventh

Circuit, which case was docketed in said court as No. 3889 and in which case the Blair patent No. 1,435,199 granted November 14, 1922, which is the patent in suit herein, was involved by counter claim made by said appellee-defendant, and that said United States Circuit Court of Appeals for the Seventh Circuit held said patent invalid in its opinion dated May 28, 1927, which said opinion is as reported in 22 Federal Reporter (2nd) 95, as follows:

"Appellants filed suit against appellee for unfair competition in the sale of heat-insulated receptacles designed to
17 keep hot liquids hot and cold liquids cold. Appellee filed a counterclaim charging that plaintiffs, in making their receptacles, infringed patent No. 1,435,199, owned by appellee and considered in the case of *Macomb Manufacturing Co.* v. *Mantle Lamp Co.* (No. 3812) 22 F. (2d) 93, decided this day.

The court dismissed the bill of complaint for want of equity, upheld the counterclaim, and adjudged the patent valid and infringed as to the same claims relied on in No. 3812. The only question presented upon the issue of unfair competition is whether the decree was right upon the evidence. We have examined the evidence, and are satisfied that it does not warrant a decree for appellants upon this issue. That part of the decree dismissing the bill of complaint is affirmed.

But we cannot approve the decree upon the patent branch of the case. For the reasons stated in our opinion in the Macomb Case, we hold the patent invalid. This part of the decree is reversed, with direction to dismiss the counterclaim. Costs shall be divided equally between the parties."

and that following denial of rehearing of said cause on December 5, 1927, the United States Circuit Court of Appeals for the Seventh Circuit in said case No. 3889 forthwith issued its mandate and the bill of complaint and counterclaim were thereupon promptly dismissed and the cause thereby finally concluded.

3. The plaintiff herein, The Mantle Lamp Company of America is the same The Mantle Lamp Company of America which was a party in the case of The Monarch Company, Inc and *The Therm-A-Jug Company, Inc., Appellants-Plaintiffs* v. *The Mantle Lamp Company of America, Appellee-Defendant,* in the United States Circuit Court of Appeals for the Seventh Circuit, which case was docketed in said court as No. 4012, and in which case the Blair patent No. 1,435,199 granted November 14, 1922, which is the patent in suit herein, was in-

volved, and that in said case said United States Circuit
18 Court of Appeals for the Seventh Circuit on October 2, 1928, made and entered its decree which is as follows:

"This cause coming on to be heard this second day of October, 1928, upon due consideration, it is now ordered that the Order and Decree entered by the District Court January 12, 1928 denying and overruling plaintiff's motion for a preliminary injunction in conformity with the prayer of the bill of complaint be and the same is hereby reversed with costs and that this cause be, and the same is hereby remanded to the said District Court of the Northern District of Illinois, Eastern Division, with directions to immediately order the issuance of a temporary injunction pending the final determination of this cause restraining The Mantle Lamp Company of America, its officers, counselors, attorneys, solicitors, trustees, agents, clerks, employees, servants, workmen, and those in active concert and participating with them;

1—From prosecuting or taking any further action in the suit of the *Mantle Lamp Company of America* v. *The Cutino Company,* pending in the United States District Court for the Western District of Missouri, as Equity No. 546, involving the structures made by the plaintiffs, The Monarch Company, Inc., and the Therm-A-Jug Company, Inc., and adjudicated by the Court of Appeals of the Seventh Circuit in the case of *The Monarch Company, Inc., and The Therm-A-Jug Company, Inc.* v. *The Mantle Lamp Company of America,* No. 3889 or bringing or prosecuting any suit against The Monarch Company, Inc., or The Therm-A-Jug Company, Inc. or their customers, involving the issues of unfair comeptition and infringement of the Blair patent No. 1,435,199 adjudicated by the Court of Appeals of the Seventh Circuit in said case No. 3889.

2—From bringing and prosecuting any other suits under said Blair patent No. 1,435,199, issued November 14, 1922, against plaintiffs or either of them or their customers, (jobbers, dealers, agents or distributors) at any time or in any place.

3—From threatening orally or in writing, directly or indirectly, plaintiffs or either of them or their customers, under or with respect to said Blair patent No. 1,435,199, dated November 14, 1922."

4. The plaintiff herein, The Mantle Lamp Company of
19 America is the same The Mantle Lamp Company of America which was a party in the case of *The Mantle Lamp*

Company of America, Petitioner, v. *The Geo. H. Bowman Company, Respondent* in the Supreme Court of the United States, docket number 673, upon Petition for Writ of Certiorari to the Circuit Court of Appeals for the Sixth Circuit to review a cause wherein the decision and decree of the Circuit Court of Appeals for the Sixth Circuit, rendered and entered November 3, 1931, in which said cause an answer was filed but defendant did not appear at the trial nor offer any evidence in support of its answer, and which said cause is referred to and relied upon in plaintiff's bill of complaint and motion for preliminary injunction herein, found claim 1 of the Blair patent 1,435,199, which is the patent in suit herein, valid and infringed and which said Petition for Writ of Certiorari set up the decision of the Circuit Court of Appeals for the Seventh Circuit in the case of *The Mantle Lamp Company of America* v. *Macomb Mfg. Co.* 22 Fed. (2nd) 93 in which claims 1, 4, 5, 6, 7, 10, 11, 12, 13, 14, 17, 18, 21, 22, 23 and 24 were held to be invalid for lack of invention and as a ground in support of said petition the diversity of opinions and decision between the Sixth and Seventh Circuit Court of Appeal in the above cases was urged and that on March 14, 1932 the said Petition for Writ of Certiorari was denied and that the denial of said petition was reported in 285 U. S. 545, 76 L. Ed. 936.

5. That the following matters which were set up in defendant's motion to dismiss the bill of complaint herein shall be taken and considered by the Court as a part of defendant's reply in opposition to plaintiff's motion for preliminary injunction:

—1—

Because this cause of action is based solely upon a patent, viz. Blair patent No. 1,435,199, granted November 14, 1922, which said patent on May 28, 1927 was decreed to be invalid by the United States Circuit Court of Appeals for the Seventh Circuit, in *Monarch Company, Inc. and Therm-A-Jug Company, Inc.* v. *Mantle Lamp Company of America* (the plaintiff herein) Docket No. 3889 and reported in 22 F. (2nd) 95, in which rehearing was denied December 5, 1927.

—2—

Because the United States Circuit Court of Appeals for the Seventh Circuit in the case of *Monarch Company, Inc.,* v. *The*

Mantle Lamp Company of America (the plaintiff herein) Docket No. 4012 (not reported) again found Blair patent 1,435,199 invalid and issued its mandate to the District Court of the Northern District of Illinois, Eastern Division, on October 8, 1928 to enjoin the plaintiff herein from further prosecuting a suit which it had brought in the United States District Court at Kansas City and from bringing or prosecuting any other suits under Blair patent 1,435,199 against the Monarch Company's customers, jobbers, dealers, agents and distributors at any time or place.

21 —3—

Because this cause of action is based solely upon a patent, viz. Blair patent No. 1,435,199 granted November 14, 1922, which said patent is wholly invalid inasmuch as no disclaimer has been made as required in Sections 65 and 71, Title 35 U. S. Code, (Revised Statutes Sections 4917 and 4922) as to claims 1, 4, 5, 6, 7, 10, 11, 12, 13, 14, 17, 18, 21, 22, 23, 24 of said Blair patent 1,435,199 which were held invalid by the United States Circuit Court of Appeals for the Seventh Circuit on May 28, 1927 in the case of *Macomb Mfg. Co.* v. *Mantle Lamp Company of America* (the plaintiff herein) Docket No. 3812, reported in 22 F. (2nd) 93, in which case rehearing was denied by said Circuit Court of Appeals on December 5, 1927.

—4—

Because the plaintiff Mantle Lamp Company of America has in its bill of complaint disregarded and failed to set forth and inform this court concerning the following litigation in the United States Circuit Court of Appeals for the Seventh Circuit and the Supreme Court of the United States involving the Blair patent 1,435,199:

1. The decision of the United States Circuit Court of Appeals for the Seventh Circuit in the contested case of *Macomb Mfg. Co.* v. *Mantle Lamp Company of America*, Docket No. 3812, reported in 22 F. (2nd) 93, in which all of the claims of the Blair patent 1,435,199 that were relied upon in said case, namely claims 1, 4, 5, 6, 7, 10, 11, 12, 13, 14, 17, 18, 21, 22, 23, 24, were declared invalid.

2. The decision of the United States Circuit Court
22 of Appeals for the Seventh Circuit in the contested case of *Monarch Company Inc., and Therm-A-Jug Company,*

Inc. v. *Mantle Lamp Company of America*, Docket No. 3889, reported in 22 F. (2nd) 95, in which the Blair patent 1,435,199 was declared invalid.

3. The decision of the United States Circuit Court of Appeals for the Seventh Circuit in the contested case of *Monarch Company, Inc.*, v. *Mantle Lamp Company of America*, Docket No. 4012, (not reported) in which the Blair patent 1,435,199 was declared invalid and an injunction decreed against the Mantle Lamp Company of America (the present plaintiff) to refrain from prosecuting and bringing suits on said Blair patent.

4. The decision of the United States Supreme Court in the case of *The Mantle Lamp Company of America, Petitioner*, v. *The George H. Bowman Company, Respondent*, Docket No. 673, reported in 285 U. S. 545, in which the Supreme Court denied the petition of The Mantle Lamp Company of America, for a writ of certiorari to the United States Circuit Court of Appeals for the Sixth Circuit to review the decision of that court in which claim 1 of Blair patent 1,435,199 was held valid, said suit not having been contested, the decision of which is reported in 53 F. (2nd) 441, and which suit has been referred to in the bill of complaint herein, the ground upon which said writ of certiorari was prayed being that the decision of the Circuit Court of Appeals for the

23 Sixth Circuit was in conflict with the decision of the Circuit Court of Appeals for the Seventh Circuit in the case of *The Mantle Lamp Company of America* v. *Macomb Manufacturing Company*, 22 F. (2nd) 93.

GEO. I. HAIGHT
W. H. F. MILLAR
Solicitors for Plaintiff.
EUGENE M. GILES
HARVEY L. HANSON
Solicitors for Defendant.

January 20, 1933.

24 And on, to wit, the 23rd day of January, 1933 came the Defendant by its attorneys and filed in the Clerk's office of said Court a certain Answer in words and figures following, to wit:

25 IN THE DISTRICT COURT OF THE UNITED STATES. Filed Jan. 28, 1933.

* * (Caption) * *

ANSWER OF DEFENDANT, ALUMINUM PRODUCTS COMPANY, TO THE BILL OF COMPLAINT OF PLAINTIFF, THE MANTLE LAMP COMPANY OF AMERICA.

1. This defendant admits the allegations in paragraph 1 of the bill of complaint relative to the corporate capacity, principal office and place of business of the plaintiff.

2. This defendant admits the allegations in paragraph 2 of the bill of complaint relative to the corporation capacity, citizenship and place of business of defendant, but denies the allegations and statement in said paragraph 2 of the bill of complaint that the defendant has committed the acts of infringement complained of in the bill of complaint.

3. This defendant admits for the purposes of the present suit the jurisdiction of the court as set up in the paragraph 3 of the bill of complaint.

4. This defendant denies each and every allegation and statement contained in paragraph 4 of the bill of complaint.

26 5. This defendant admits the issuance of the Letters Patent identified in paragraph 5 of the bill of complaint to The Mantle Lamp Company of America, a corporation of Illinois, but denies each and every other allegation in paragraph 5 of said bill of complaint.

6. This defendant denies each and every allegation contained in paragraphs 6, 7 and 8 of the bill of complaint.

7. This defendant as to the allegations of paragraph 9 of the bill of complaint admits only that on the 18th day of January, 1928 the Mantle Lamp Company of America brought its bill in equity in the District Court of United States, for the Northern District of Ohio, Eastern Division, against The Geo. H. Bowman Company and in said suit complained that The Geo. H. Bowman Company had infringed and threatened the further infringement of Letters Patent No. 1,435,199; admits that an answer was filed in the name of The Geo. H. Bowman Company to the said bill of complaint and that the said cause came on to be heard before the Honorable S. H. West, Judge of said District Court; admits that on the 12th day of September, 1929 the court ordered a decree for The

Geo. H. Bowman Company against The Mantle Lamp Company of America and denying the validity of the Letters Patent 1,435,199 for want of invention; admits that thereafter and on the 19th day of November, 1929 The Mantle Lamp Company of America prayed an appeal from the said decree of the District Court to the United States Court of Appeals for the Sixth Circuit and filed therein its assignment of errors; admits that thereafter the said cause came on to be heard before the Judges of the United States Circuit Court of Appeals for the Sixth Circuit and that the Circuit
27 Court of Appeals for the Sixth Circuit in an opinion filed November 3, 1931 reversed the decree of the District Court with instructions to enter the usual decree for said plaintiff on claim 1 of Letters Patent No. 1,435,199 and without prejudice to any rights of said plaintiff under any other claim, but this defendant denies each and every other allegation, statement and representation in paragraph 9 which is not specifically admitted herein, and denies the inference of said paragraph 9 that the case set up therein was a regularly contested controversy and this defendant avers that the information given by plaintiff in paragraph 9 is incomplete, misleading and deceptive and that, contrary to what would naturally be understood from the matters as they are set out in paragraph 9 and the purpose for which they are presumed to have been recited in this bill of complaint, the suit of The Mantle Lamp Company of America against The Geo. H. Bowman Company was not a contested case,—that, although an answer was filed in the name of The Geo. H. Bowman Company, no evidence was offered by The Geo. H. Bowman Company,—that the only evidence offered was that of The Mantle Lamp Company of America,—that the said evidence of The Mantle Lamp Company of America was offered and the testimony of its witnesses taken without any opposition or cross-examination by The Geo. H. Bowman Company, that prior patents set up in defense in the answer of The Geo. H. Bowman Company were furnished and put into evidence by The Mantle Lamp Company of America and a favorable decision on claim 1 of the Blair patent No. 1,435,199 thus obtained in which the Blair patent in the suit and the prior art pat-
28 ents set up in the answer of The Geo. H. Bowman Company were considered in the light of the unopposed testimony of The Mantle Lamp Company of America witnesses that had not been subjected to cross examination,—that no briefs were filed on behalf of The Geo. H. Bowman Company

in the said District Court or in the Court of Appeals for the Sixth Circuit, that there was no appearance or argument for or on behalf of The Geo. H. Bowman Company at the hearing of said cause in the District Court of the United States for the Northern District of Ohio, Eastern Division, before the Honorable S. H. West, Judge of said District Court,—that there was no appearance or argument for or on behalf of The Geo. H. Bowman Company at the hearing of said cause in the Court of Appeals for the Sixth Circuit,—and that the decision of the Circuit Court of Appeals for the Sixth Circuit set up and relied upon by complainant herein is of no force or effect whatsoever in establishing validity of the Blair patent No. 1,435,199, or claim 1 thereof, or in establishing any right on the part of plaintiff to any of the relief sought herein.

8. This defendant further answering the bill of complaint avers that the Blair Patent No. 1,435,199 has been involved unfavorably in other litigation to which the present plaintiff was a party and in regard to which said other litigation no information is given in the bill of complaint,—and as to such other litigation this defendant avers that:

A. The plaintiff herein, The Mantle Lamp Company of America was a party in the fully contested case of *Macomb Mfg. Company, appellant-defendant,* v. *The Mantle Lamp Company of America, appellee-plaintiff,* in the United States Circuit Court of Appeals for the Seventh Circuit, which case was docketed in said court as No. 3812, that in said case the Blair patent No. 1,435,199 granted November 14, 1922, which is the patent in suit herein, was held to be invalid as to claims 1, 4, 5, 6, 7, 10, 11, 12, 13, 14, 17, 18, 21, 22, 23 and 24 by said United States Circuit Court of Appeals for the Seventh Circuit in its opinion dated May 28, 1927, in which case rehearing was denied by said United States Circuit Court of Appeals for the Seventh Circuit on December 5, 1927, and that following denial of rehearing of said cause on December 5, 1927, the United States Circuit Court of Appeals for the Seventh Circuit in said case No. 3812, forthwith issued its mandate and the bill of complaint was thereupon promptly dismissed and the cause thereby finally concluded.

29

B. The plaintiff herein, The Mantle Lamp Company of America was a party in the fully contested case of Monarch Company, Inc., and *Therm-A-Jug Company, Inc., appellants-plaintiffs,* v. *The Mantle Lamp Company of America, appellee-defendant,* in the United States Circuit Court of Appeals for the Seventh Circuit, which case was docketed in

said court as No. 3889 and in which case the Blair patent No. 1,435,199 granted November 14, 1922, which is the patent in suit herein, was involved by counter claim made by said appellee-defendant, and that said United States Circuit Court of Appeals for the Seventh Circuit held said patent
30 invalid in its opinion dated May 28, 1927, and that following denial of rehearing of said cause on December 5, 1927, the United States Circuit Court of Appeals for the Seventh Circuit in said case No. 3889 forthwith issued its mandate and the bill of complaint and counter-claim were thereupon promptly dismissed and the cause thereby finally concluded.

C. The plaintiff herein, The Mantle Lomp Company of America was a party in the fully contested case of The Monarch Company, Inc., and *The Therm-A-Jug Company, Inc., Appellants-Plaintiffs* v. *The Mantle Lamp Company of America, Appellee-Defendant,* in the United States Circuit Court of Appeals for the Seventh Circuit, which case was docketed in said court as No. 4012, and in which case the Blair patent No. 1,435,199 granted November 14, 1922, which is the patent in suit herein, was involved, and that in said case said United States Circuit Court of Appeals for the Seventh Circuit on October 2, 1928, made and entered its decree enjoining the plaintiff herein from bringing, prosecuting or threatening suit under the Blair patent No. 1,435,199 against certain parties mentioned and referred to therein.

D. The plaintiff herein, The Mantle Lamp Company of America was a party in the case of *The Mantle Lamp Company of America, Petitioner,* v. *The Geo. H. Bowman Company, Respondent* in the Supreme Court of the United States, docket number 673, upon Petition for Writ of Certiorari to the Circuit Court of Appeals for the Sixth Circuit to re-
31 view the cause set up in paragraph 9 of the bill of complaint herein wherein the decision and decree of the Circuit Court of Appeals for the Sixth Circuit, rendered and entered November 3, 1931, found claim 1 of the Blair Patent 1,435,199 valid and infringed, and said Petition for Writ of Certiorari set up the decision of the Circuit Court of Appeals for the Seventh Circuit in the case of *The Mantle Lamp Company of America* v. *Macomb Mfg. Co.* in which claims 1, 4, 5, 6, 7, 10, 11, 12, 13, 14, 17, 18, 21, 22, 23 and 24 were held to be invalid for lack of invention and as a ground in support of said petition the diversity of opinion and decision between the Sixth and Seventh Circuit Courts of Appeal in the above

cases was urged and that on March 14, 1932 the said Petition for Writ of Certiorari was denied, and this defendant avers that by reason of the litigation mentioned in the above sections A, B, C and D of this paragraph and the findings, decisions, decrees and orders of the respective courts therein the Blair Patent No. 1,435,199, and each and every claim thereof is wholly invalid and ineffective to entitle the plaintiff to any of the relief sought herein.

9. The defendant further answering the bill of complaint avers that no disclaimer as required by the statutes of the United States has been made and/or filed in the United States Patent Office, in connection with Blair Patent 1,435,199, as to claims 1, 4, 5, 6, 7, 10, 11, 12, 13, 14, 17, 18, 21, 22, 23 and 24 thereof which were held invalid by the United States Circuit Court of Appeals for the Seventh Circuit on May 28, 1927 in the case of *Macomb Mfg. Co.* v. *The Mantle Lamp Com-*
32 *pany of America,* Docket No. 3812, referred to in Section A of paragraph 8 hereof, and that because no disclaimer has been filed as aforesaid Blair Patent No. 1,435,-199 is entirely invalid.

10. This defendant further avers that the plaintiff herein well knowing at the time it filed its bill of complaint that in view of the matters set up in paragraph 8 herein it was not entitled to the relief sought by it in its bill of complaint,—and well knowing at the time it filed its bill of complaint that the Blair Patent No. 1,435,199 was invalid because no disclaimer had been filed as required by the United States statutes as set out in Paragraph 9 herein, and well knowing at the time it filed its bill of complaint that the actual proceedings referred to in paragraph 9 of its bill of complaint did not establish any right to the relief sought herein, has wilfully, deliberately and intentionally set forth and portrayed the proceedings in the Bowman case that is recited in paragraph 9 of its bill of complaint so that it appeared to be an ordinary contested patent infringement case and has wilfully, deliberately and intentionally omitted from its bill of complaint information with respect to the proceedings set out in paragraph 9 of its bill of complaint all of which is essential for a complete and fair understanding of said proceedings and the effect thereof as to said Blair patent, and has likewise wilfully, deliberately and intentionally omitted from its bill of complaint information regarding the other litigation set up in paragraph 8 of this answer in order that this Court might not be informed as to the true situation with respect to the Blair patent No. 1,435,199, and that because of such wilful, delib-

erate and intentional misrepresentations and omissions, the plaintiff is not entitled to any relief which it seeks through its bill of complaint.

33 11. This defendant, further answering the bill of complaint has long prior to the filing of its bill of complaint had knowledge of the acts of defendant complained of in the bill of complaint and that because of its long delay in offering an objection to said acts and its long delay after knowledge of defendant's said acts in bringing its bill of complaint, the complainant is not entitled to any relief prayed for herein.

12. This defendant, further answering the bill of complaint, avers that said Letters Patent 1,435,199 and each of the claims thereof is invalid and void for the following reasons:

(a) Because the specification of said letters patent is incomplete and indefinite and does not set forth the alleged invention in such full, clear, concise and exact terms as to enable persons skilled in the art to which it appertains, or with which it is most clearly connected, to make, construct and use the same, does not particularly point out and definitely claim the parts, improvements or combinations constituting the alleged invention as required by the statutes of the United States.

(b) Because the said Blair letters patent do not disclose patentable subject matter of invention or discovery within the meaning of the patent law, but, on the contrary, set forth and describe only old and familiar constructions and devices of common and ordinary knowledge, practice and manufacture long prior to the alleged invention thereof by the said Blair, and within the knowledge, reach and disposal of any skilled worker or mechanic in the art to which the alleged

34 invention relates, and in the analogous arts at the time of, and for many years before, the alleged invention of Blair, and that the structure and details thereof set forth in said patent represented nothing more than the usual and expected mechanical skill commonly employed by workers in such arts.

(c) Because the subject matter of said patent was not invention, contained no patentable novelty and was not a new improvement in the art.

(d) Because the claims of said patent 1,435,199 do not define patentable combinations of elements as required by the statutes of the United States, but recite merely aggregations of old well known elements to produce old and well known results.

(e) Because Blair was not the original, first and sole inventor of the alleged invention or improvement described and claimed in said letters patent, or of any material or substantial part thereof, but that on the contrary, the same and every material and substantial part thereof, had been, long prior to the alleged invention of Blair, patented and/or described in divers patents and printed publications, as hereinafter stated, and in others to which defendant prays leave to refer hereafter, by amendment or otherwise, when it has fully ascertained the same, the several patents being also set up as printed publications:

United States Letters Patent

	Number	Inventor	Date
Re	13,093	Burger & Aschenbrenner	March 15, 1910
	46,640	Clark	Mar. 7, 1865
	147,459	Wiesebrock	Feb. 10, 1874
	184,256	Moore	Nov. 14, 1876
35	211,092	Heath	Jan. 7, 1879
	358,732	Clisbee	Mar. 1, 1887
	386,231	Bassler	July 17, 1888
	438,149	Fox	Oct. 14, 1890
	707,634	Place	Aug. 26, 1902
	797,577	Heylandt	Aug. 22, 1905
	820,347	Burger & Aschenbrenner	May 8, 1906
	884,582	Henn	Apr. 14, 1908
	900,075	Altenberg	Oct. 6, 1908
	916,814	Williams	Mar. 30, 1909
	916,815	Williams	Mar. 30, 1909
	922,174	Lyman	May 18, 1909
	928,002	Paalen	July 13, 1909
	930,204	Marsh & Thompson	Aug. 3, 1909
	1,000,172	Hopkins	Aug. 8, 1911
	1,002,009	Steel	Aug. 29, 1911
	1,029,364	Hartwig	June 11, 1912
	1,033,398	Heylandt	July 23, 1912
	1,056,971	Coleman	Mar. 25, 1913
	1,067,072	Steel	July 8, 1913
	1,071,817	Stanley	Sept. 2, 1913
	1,084,453	St. Vrain Le Sieur	Jan. 13, 1914
	1,119,968	St. Vrain Le Sieur	Dec. 8, 1914
	1,161,261	Sturges	Nov. 23, 1915
	1,199,772	Engel	Oct. 3, 1916
	1,307,907	Simonson & Blair	June 15, 1919
	1,309,967	Simonson & Blair	July 15, 1919

Number	Inventor	Date
1,333,795	Davis & Sunderlin	Mar. 16, 1920
1,362,740	Rood & Johnson	Dec. 21, 1920
1,431,189	Smith	Oct. 10, 1922
1,497,764	Simonson & Blair	June 17, 1924

British Letters Patent

835 of 1881 to E. J. Gaskell et al.
817 of 1893 to Johnston.
1,910 of 1911 to Dommel.

French Letters Patent

380,824	Van Wye	Dec. 18, 1907
403,572	Marchet	June 1, 1909
403,574	Societe Primas Gessel-Schaft Ritzhaupt & Co.	June 1, 1909
411,568	L. Lodo et al	June 20, 1910

Publications

Knight's American Mechanical Dictionary published by J. B. Ford and Company in New York, U. S. A. in 1874, page 507.

36 (f) Because Blair was not the true, original, first, and sole inventor of any patentable improvements forming subject matter of said letters patent 1,435,199, but that various persons at various places have had knowledge and made use of the things alleged to be patented, and of every material and substantial part thereof long prior to the alleged invention by the said Blair and that the following is the list of names and addresses of said users, said addresses being also the places where the uses occurred and knowledge was had:

Name	Address
The Therm-A-Jug Company	Webster City, Iowa
The Monarch Company, Inc.	Webster City, Iowa
Guy Burton	Webster City, Iowa
William B. Rood	Webster City, Iowa
Charles W. Owens	Webster City, Iowa
Ernest S. Johnson	Webster City, Iowa
William Tweedie	Webster City, Iowa
Federal Mfg. Co.	Des Moines, Iowa
National Mfg. Co.	Des Moines, Iowa
Stanley Insulating Company	Great Barrington, Mass.
Herbert M. Smith	Great Barrington, Mass.

and the officers, employees and agents of the named companies at the company addresses and elsewhere in the United States and each of the individuals named in the foregoing patents at the addresses therein given and elsewhere,—and this defendant is not now advised of the names and addresses of additional persons and places of use although making diligent search therefor, but prays leave of this Honorable Court to insert said names and addresses of said persons and places of use by amendment to this answer as soon as ascertained.

13. This defendant further answering avers that said patent 1,435,199 is so limited and narrowed down to
37 specific features of the heat insulated receptacles disclosed therein, by proceedings in and in connection with the prosecution of the application in the Patent Office which resulted in the obtaining of said patent that said patent is not entitled to a construction to include defendant's alleged infringing structure.

Wherefore the defendant denies that it has done any act or thing, or is doing any act or thing or intends to do any act or thing in violation of any right, exclusive or otherwise, belonging to the plaintiff, or alleged to be secured to plaintiff by said letters patent, and denies that plaintiff is entitled to any relief of any nature in respect to the matters prayed for in the bill of complaint; and defendant prays that the bill of complaint herein be dismissed with costs to the defendant.

ALUMINUM PRODUCTS COMPANY
By EUGENE M. GILES
HARVEY L. HANSON
Its Solicitors.

38 And on, to wit, the 27th day of October, 1933, came the Defendant by its attorneys and filed in the Clerk's office of said Court a certain Notice in words and figures following, to wit:

39 IN THE UNITED STATES DISTRICT COURT.
• • (Caption) • •

NOTICE.

Mr. George I. Haight,
1041 The Rookery,
Chicago, Illinois
and
Mr. W. H. F. Millar,
First National Bank Bldg.,
Chicago, Illinois,
Solicitors for Plaintiff.

Gentlemen:

Please take notice that at the trial of the above entitled cause the defendant, Aluminum Products Company, besides the defenses set up in its answer, will rely upon the further defense of invalidity of Letters Patent No. 1,435,199 because of previous invention and knowledge of the subject matter thereof by various persons other than Lewis Van Deventer Blair, as follows, to-wit:

Because Blair was not the original and first inventor or discoverer of any material and substantial part of the subject matter of Letters Patent No. 1,435,199, and the alleged invention or improvements of said letters patent were previously known to and invented or discovered by various
40 persons and at various places long prior to the alleged invention or discovery thereof by said Blair, and more particularly by the following named persons at the places mentioned:

Name	Address
Reinhold Burger	Berlin, Germany
Albert Aschenbrenner	Berlin, Germany
Moses M. Clark	Monroe, New York
Friedrich W. Wiesebrock	New York, New York
Eugene A. Heath	New York, New York
Clarence E. Clisbee	Boston, Massachusetts
John H. Bassler	Myerstown, Pennsylvania
John W. Fox	Cleveland, Ohio
George P. Altenburg	Cincinnati, Ohio
Paulus Heylandt	Erfurt, Germany
Huber Henn	Berlin, Germany

Name	Address
David Arthur Williams	Represa, California
John G. Lyman	Philadelphia, Pennsylvania
George A. Marsh	Marshville, N. Carolina
Hiram H. Thompson	Washington, D. C.
John S. Hopkins	Brooklyn, New York
Leonard R. Steel	Cleveland, Ohio
Robert Hartwig	Berlin, Germany
Christian Wilhelm Paulus Heylandt	Schulau, Germany
Clyde J. Coleman	New York, New York
Gustav Robert Paalen	Berlin, Germany
St. Vrain Le Sieur	East St. Louis, Illinois
John J. Engel	Pittsburgh, Pennsylvania
William W. Simonson	Cincinnati, Ohio
William B. Rood	Webster City, Iowa
Herbert Mc Smith	Great Barrington, Mass.
Ernest S. Johnson	Webster City, Iowa
Lee Sturgis	Chicago, Illinois
William Stanley	Great Barrington, Mass.
Cortland W. Davis	Chicago, Illinois
Frank R. Sunderlin	Chicago, Illinois
James F. Place	Glenridge, New Jersey

WILLIAM NAVARRE CROMWELL,
Solicitor for Defendant.

Receipt of a copy of the foregoing notice is hereby acknowledged and service of the same is hereby accepted this 25th day of September, 1933.

GEORGE I. HAIGHT
W. H. F. MILLAR
Solicitors for Plaintiff.

41 And on, to wit, the 27th day of October, 1933, came the parties by their attorneys and filed in the Clerk's office of said Court a certain Stipulation in words and figures following, to wit: Filed Oct. 27, 1933.

42 IN THE DISTRICT COURT OF THE UNITED STATES.
* * (Caption) * *

STIPULATION.

It is hereby stipulated and agreed, by and between counsel for the parties hereto, that uncertified printed or photo-

graphic copies of United States and foreign patents and printed publications may be introduced and admitted in evidence, subject to correction for error if any there be, as proof of such patents and printed publications, and that the dates of filing, sealing, delivery or publication, as recited therein, and the stamped dates of receipt by the United States Patent Office appearing on copies of foreign patents, shall be taken as establishing such dates, without further proof, subject to correction for errors.

W. H. F. MILLAR
Solicitors for Plaintiff.
WILLIAM NAVARRE CROMWELL,
Solicitor for Defendant.

43 Endorsed: District Court of the United States. • • (Caption) • • Condensed Narrative Statement of Evidence. Filed Dec 14 1934 Charles M. Bates Clerk Lodged Nov 27 1934 Charles M. Bates, Clerk.

1 44 Before the Honorable John P. Barnes, District Judge.

Trial had from October 24, 1933 to October 30, 1933.

Appearances:

For the Plaintiff,—George I. Haight, W. H. F. Millar, Chicago, Illinois.

For the Defendant,—William Navarre Cromwell, Chicago, Illinois.

2 Mr. Millar: Certified copy of patent in suit offered in evidence as PLAINTIFF'S EXHIBIT 1.

Mr. Cromwell: Objected to for the reason that because of the decisions of the Circuit Court of Ap-
45 peals, this patent is not a valid grant, has no status before this court and in the circumstances is entirely incompetent upon which to base any claim or right of action by the plaintiff.

The Court: Objection overruled.

(Admitted as Plaintiff's Exhibit 1).

3 Mr. Millar: We offer in evidence certified copy of bill of complaint in the action of "*The Mantle Lamp Company of America, Plaintiff*, v. *The George H. Bowman Company, Defendant*, in Equity, No. 2506, United States District Court, Northern District of Ohio, Eastern Division", as PLAINTIFF'S EXHIBIT 2.

Mr. Cromwell: Same objection as made to Plaintiff's Exhibit 1.

Mr. Millar: Plaintiff's Exhibit 2 is material because plaintiff is relying to a certain extent and has set up in its pleadings the decision of the Circuit Court of Appeals in the Sixth Circuit, so we are now by the bill of complaint and the answer and the decree endeavoring to show what the proceedings were that took place and what the issues were. The records in the other two cases in the Seventh Circuit are here. It would be convenient for the court to put this in evidence in the record in this
4 case. The findings of the Sixth Circuit Court of
46 Appeals is law but may not be controlling on the court, but the files have to be submitted subject to factual proof on the issues here.

The Court: Objection sustained. The decision of the Sixth Circuit Court of appeals is authority, good, bar or indifferent. You may at the same time show me the records of the District Court in Ohio, of the Circuit Court of Appeals of the Sixth Circuit, which I will consider in interpreting that authority but I don't see that it is evidence here. Objection sustained.

Mr. Millar: Certified copy of opinion of the Circuit Court of Appeals for the Sixth Circuit in the same case, offered in evidence.

Mr. Cromwell: Same objection.

The Court: Same ruling.

Mr. Millar: Certified copy of answer in the District Court in the same case, offered in evidence.

Mr. Cromwell: Same objection.

The Court: Same ruling.

Mr. Millar: Certified copy of decree under mandate
5 of District Court in the same cause, offered in evidence as Plaintiff's Exhibit 5.

Mr. Cromwell: Same objection.

The Court: Same ruling.

Mr. Millar: To which rulings we except.

47 WILLIAM WALLACE MEISSNER, called as witness on behalf of plaintiff, testified as follows:

My name is William Wallace Meissner and I live in Itasca, Illinois. My occupation is that of sales supervisor for The Mantle Lamp Company, the plaintiff. I

have been connected with The Mantle Lamp Company for eleven years.

6 The document you hand me I have seen before. I received it when I bought one of these Alladin jars from Carson, Pirie, Scott & Company, a bill of payment. It is in the same condition as when I received it with the exception of pencil memorandum I made at time I purchased this jar. The words "Manufactured by the Aluminum Products Company, La Grange, Illinois," are in my handwriting. I received the document on July 13, when I purchased a jar.

7 I have seen the jar marked Plaintiff's Exhibit 6 for identification. It is the jar I purchased from Carson, Pirie, Scott, to which I have just referred.

48 The jar has been cut open and a rag inserted and the stopper is missing, otherwise the jar is in the same condition as when I purchased it.

I made a pencil memorandum "Purchased by Meis, sner Carson, Pirie, Scott & Company" on the bottom of the jar when I purchased it, from Carson, Pirie, Scott.

The neck of the jar has been opened up and examined. There was a cup cap on top of the stopper.

I visited the plant of the defendant Aluminum Prod-
8 ucts Company in March, 1932. I purchased a jar of this type from them. I am familiar with its structure. This jar, Plaintiff's Exhibit 6 for identification, is manufactured by the Aluminum Products Company.

9 Jar received in evidence as PLAINTIFF'S EXHIBIT 6.

10 Bill of Carson, Pirie, Scott & Company, for purchase of jar, received in evidence as PLAINTIFF'S EXHIBIT 7.

11 49 *Cross-Examination by Mr. Cromwell.*

My pencil memorandum of Plaintiff's Exhibit 7 leads me to believe that jar referred to was made by Aluminum Products Company.

The construction and label on Plaintiff's Exhibit 6 indicates that jar was made by Aluminum Products Company because I bought a jar of the same type from the Aluminum Products Company in March 1932. The jar probably can be obtained; it may be in my possession.

12 50 CORTLAND W. DAVIS, called as witness on behalf of plaintiff, testified as follows:

My name is Cortland W. Davis. I live in Alexandria, Indiana. My occupation is that of Mechanical Engineer, for the Mantle Lamp Company of America and have
13 been connected with them for approximately twenty-three years, in charge of the manufacturing and of research work.

I attended Cornell University, Ithaca, New York and was graduated therefrom on June 20, 1907 with the degree of mechanical engineer.

I have had experience in the preparation of applications for patents and the prosecution of patent applications before the patent board for practically the duration of my employment with the Mantle Lamp Company of America.

I have had experience in research and experimental work with regard to heat insulated receptacles; being in charge of research of the company my work has been
14 the overseeing of all work done in that line by the company.

I am a registered patent solicitor having had experience in the prosecution of patent applications
51 personally before the patent office other than the United States, in several foreign countries in Europe.

I am familiar with the structure of the device, Plaintiff's Exhibit 6. This article is a heat insulated container of the non-vacuum type. It has an outer metallic jacket in multiple sections joined together by a circumferential seam within the jacket and an inner vitreous container bonded to the neck to the outer jacket, and between the outside of the inner container and the inside of the metal jacket comminuted insulating material is positioned. The container also is provided with a cork, but no cap in this particular exhibit.

15 The material between the necks of the jacket and container consists largely of sulphur its function being to form a bond between the neck of the inner container and the contracted neck of the outer jack, uniting the two mechanically, and also preventing moisture entering in the space between the inner container and the outer jacket.

The upper extremety of the outer jacket has a contracted threaded section and an inturned annular lip extending over the inner container. The purpose of the inturned flange is to facilitate the assembly of the container to the jacket and to afford protection to the
52 frangible container. I am familiar with the substances that may be used as a bond, as the bond de-
16 scribed is used. There are many synthetic materials, synthetic resins, plaster of paris, sulphur, anything that may be introduced and will solidify in place to perform its function. Sulphur as used in that container is substantially non-porus.

When I first saw this jar it was not in the condition I now find it. At my direction these cuts were made in the jar, one at the lower extremity and one at the upper extremity. After having made those cuts I found the material between the jacket and the container was dry sawdust. One of the cuts exposes the neck of the container, the neck of the jacket is cut away.

17 With reference to the outer side of the neck of the container there is an annular groove, encircling the outer surface of the inner container of the nck.

When the inner container is placed within the outer jacket and molten sulphur is poured into the space between the two necks, or the neck of the outer jacket and the inner container, sulphur when it solidifies becomes an interlocking element which bonds the outer jacket and the inner container. My means of this interlocking bond the container is supportable in that jacket.

53 The stopper is positioned within the jar when in use. It has a flange provided with a rubber gasket which rests on the top of the container and a depending section which goes into the mouth of the inner jacket and
18 is loose and spaced apart from the inner wall.

I am familiar with the properties of that type of sulphur with respect to its ability to conduct heat. It is in the class of non-conductor.

The inner container is made of earthenware. It is inherently frangible, easily broken. The container has an inner surface that has been glazed, vitrified. In the
19 manufacture of earthenware containers, the manufacturers put a ceramic material, known as a slip, which glazes its inner surface and the outer side of this container is not glazed. It is rough and partially porous.

The characteristic of a glazed or vitreous surface is waterproof.

I have had experience in endeavoring to seal or join a vitreous substance to a metal substance. Some of the usual methods of joining metal to metal, it may be interlocked by folds, soldered, brazed, welded, several different methods of joining metal to metal. None of those methods are available for joining a vitreous substance and a metallic substance as used in that jar.

I have made, or have had made under my direc-
20 54 tion, tests to determine the efficiency of various types of heat insulated receptacles; that included an examination of receptacles other than those made in accordance with the Blair patent.

In heat insulated receptacles of the non-vacuum type, insofar as efficiency is concerned, if the container had contact with the jacket at more than one place, contacts between the inner container and the outer jacket would lessen the efficiency because of heat conducted through the contact.

I have had experience to determine the relative efficiency of containers of that type where the material between the walls of the container and the jacket were on the one hand dry and on the other hand moist. As a heat insulated receptacle the dry is decidedly more efficient.

A container having both a metallic jacket and a metal-
21 lic inner container is less efficient that a container with a vitreous inner container.

The principal path of heat loss in the device, Plaintiff's Exhibit 6, is at the top, at the point where the inner container and the outer jacket are joined.

With respect to moisture which may get between the walls of the container and the jacket, the proper seal or bonding material precludes the entrance of moisture in that junction. The seal or material I find in Plain-
55 tiff's Exhibit 6 does so act to preclude moisture.

I am familiar with the patent in suit. It is my
22 opinion that claims of Plaintiff's Exhibit 1 read on Plaintiff's Exhibit 6.

Q. Will you kindly indicate to us which ones are so read in this Exhibit 6?

Mr. Cromwell: I object to this line of examination. It seems to me it is the function of this Court to determine the reading. Mechanical construction is to be in-

terpreted by this witness, but the interpretation of these claims is essentially the function of the Court.

The Court: I suppose the Court is to determine whether or not there is an infringement and that is a conclusion, and perhaps what he has asked for is a conclusion. But I don't think that is the exact question.

Mr. Cromwell: Let's have the question read.

(Question read by the reporter.)

Mr. Cromwell: It is essentially an interpretation of those claims, your Honor.

The Court: Yes, but I don't think it is the exact question the Court is called to pass upon. He is qualified as an expert in this matter and I think the Court is entitled to the benefit of his testimony and to the benefit of your cross examination. Objection overruled.

Mr. Cromwell: Exception.

23 56 The Witness: I have a file copy of this Exhibit 1. On this copy I have read the claims and in my judgment No. 1, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 17, 18, 21, 22, 23, 24, and these claims recite elements which I find in Plaintiff's Exhibit 6.

The Court: Which ones did you omit, 2 and 16?

Mr. Haight: 2, 15, 16, 19, and 20, if the court please.

24 Between the device here, Plaintiff's Exhibit 6 and the device disclosed in the patent I find very little diference structually. Functionally, no difference.

The structual differences I find are, in the Blair device a glass stopper has been used, while in Exhibit 6 an aluminum stopper has been used.

In the Blair device an inner vitreous container is 57 used, which is of glass, while in Exhibit 6 the inner container is of vitreous earthenware. There is a difference in the general shape and configuration. No other essential difference between the two.

In Plaintiff's Exhibit 6, the comminuted material interposed in the space between the outer wall of the inner container and the inner wall of the outer jacket prevents convective air currents and the transmission of heat from the inner container to the outer jacket, and also tends to limit pendulous movement of the inner container. The 25 sawdust material is considered a non-conductor of heat. The material between the container and the jacket would lessen the indentation of the outer jacket if it was subject to shock and possibly preclude the breaking of the frangible container.

Cross-Examination by Mr. Cromwell.

I testified in the other litigations, the Monarch suit and the Macomb Manufacturing Company suit, involving the same patent.

As to what I meant by pendulous movement as a characteristic of the inner container, any container suspended
26 in its upper extremity with the balance of the container free will inherently possess a slight amount of pendulous movement, It is inevitable. Swinging, jarring,
58 striking something, induces that pendulous movement. In swinging an article if you hit it against something, a little vibration or a little movement. The degree of that pendulous movement in a container of this sort would be very slight. It is difficult to measure and reduce to decimals of an inch, but I would say very slight.

Q. Have you ever made any tests to determine that?

A. None, only having a container empty to feel of it and see—

Q. I asked you if you had made those tests.

A. I have made those tests.

Q. And what have those tests indicated?

A. What I have said it did, move slightly.

Q. How did you determine that?

A. Hearing it, seeing it move, very slight movement.

27 Q. You say it is practically infinitesimal and yet you say you saw it.

A. You can feel it give.

Q. Where did you feel it?

A. In my hands.

Q. Where did you put your hands when you felt that movement?

A. Take one of these receptacles, when the inner container—

Q. You are referring to Plaintiff's Exhibit 6?

A. This type of receptacle. When the inner container is bonded to the top, without the bottom jacket being secured to the upper section and inverted without the filling that is in it, before any of the material is injected between, you can feel a slight movement by straining at the bottom of the inner container.

59 Q. That is an abnormal condition, isn't it?

A. No, normal.

Q. You say without there being any filling in it. That

would be an abnormal condition of that container, wouldn't it?

A. I wouldn't say so, no.

Q. How can it be normal if you haven't got that packing in it between the inner container and the jacket?

A. The material that is packed isn't rigid enough or substantial enough to resist that pendulous movement. It may limit it slightly, but is wouldn't entirely over-
28 come it.

The maximum movement of that container when there is not any packing in between the container and the jacket is possibly more than there would be if the packing was there. I cannot tell in some decimal of an inch. I
60 didn't ever make any test, only by feeling it and determining that such a movement existed. No measurement of movement was taken. I could see it, feel it. I saw and felt the movement. I could see the bottom was
29 moving relative to the other section. The container was within the jacket of the jar at the time I made this test. I tried to explain that the test I made was when the lower section of the outer container was not secured to the upper section so that the bottom of the inner container was entirely open and could be readily seen and moved. There was no insulating material in the jacket or casing, other than the bond where it was secured at the top, it was perfectly free. It was not a free body. The character of the bond by which that container was supported from the top of that jacket was an organic bond. In the particular tests which I made the material of the bond was an indurated organic material of the type invented by this same inventor, Mr. Blair, and a co-worker, Mr. Simonson. I believe it is covered by a patent owned by The Mantle Lamp Company. I think the so-called Simonson & Blair patent.

30 United States Letters Patent 1,309,967, dated July 15, 1919, granted to Mantle Lamp Company of America as the assignee of William W. Simonson and Louis V. D. Blair is the patent just referred to, and it was the composition covered by this patent and disclosed in this patent that constituted the bond of the receptacle that
61 I saw this movement in; that character of bond has been used continuously by The Mantle Lamp Com-
62 pany in its jugs. There has been some difference—no substantial difference—in the constituency of the bond covered by this patent or disclosed in this patent

and that which is used by the Mantle Lamp Company in its jug. Originally a certain amount of carbon was included with the synthetic gum that Mr. Blair and Simon-
31 son developed, and there were lead derivatives of that gum used in some early models, but later practically the untreated resinous material was used without the carbon. The present constituency of the bond which I have just described, is the present composition that the Mantle Lamp Company used in its jugs.

I said I could readily detect the degree of that movement of the container with respect to the part from which it was suspended. How much movement there was depends upon the force that is exerted on the container, I found there was a flex in the jacket sufficient to allow
32 pendulous movement and that pendulous movement in the bottom of the inner container can be readily seen and felt.

Q. Was the top of the jacket to which that container was then connected supported by anything?

A. The top of the jacket?

Q. Yes, to which the container was connected, was that top—

A. It was just sitting on a table or on a bench.

Q. What was the exact operation that you performed to find out what that movement was? Tell us that, will you?

63 A. I will repeat that. In the manufacture of these jars, the actual jacket is in several sections or parts and the simplest way of assembling the inner container to the outer jacket—

Q. I am not concerned with that.

A. I am trying to explain.

Q. I am asking you to tell me how you determined that was supported at the time you made the test—

Mr. Millar: I submit the witness be allowed to answer.

Mr. Cromwell: I want to get this determined.

The Court: I think he can answer. How, if at all, was the top of the jacket supported at the time you made the test?

33 Mr. Cromwell: That is the idea.

The Witness: It was bonded by this Simonson Blair material.

Mr. Cromwell: Q. I understand, Mr. Davis, that the crock or the earthenware receptacle or container was bonded to this metallic part of the jug.

A. The upper section.
Q. At the top.
A. Yes, at the top.
Q. But this particular top of the jug was not connected with the lower part of the jug at that time, was it?
A. That is right.
Q. And if I understand you further, you had this jug sitting on a table for support.
A. Yes.
Q. And it was really the support given by the
64 table that sustained the weight of the jug, wasn't it?
A. It was in an inverted position sitting on the table, yes.
Q. And supported by the table.
A. Yes.
Q. Now, I ask, if you please, what did you do to determine the character of the movement that you said you felt; what kind of test did you subject the thing to?
A. If you will hold this in an inverted position—
Q. Well, was that what you did then?
A. —and hold one hand on the jacket and the other
34 hand on the container and exert a strain between the two you can feel the flex of one relative to the other.
Q. You were imposing a manual force there, that isn't imposed on the jug or the container when it is in use.
A. I apprehend that swinging this jar and striking something will induce a force of a similar nature.
Q. How did that particular test you made that day approach a test when you are swinging it and striking it against some object, how did it approach that? Now, tell us.
A. I don't quite understand the question very clearly.
Q. Well, you say, as a matter of fact, if you hit that container against an object there will be a movement of the jug?
A. Yes.
65 You didn't hit that against any object, did you, that day?
A. I have hit many of them—
Q. I am talking about the time you say the test was made. Confine yourself to that.
A. The test I am taking about, the jug was not assembled, completely assembled.
Q. Then, as a matter of fact, if I understand your

position correctly, the only way you determined the relative movement, or pendulous movement, if you please, was because you took that jug and you moved the jug itself, that is the earthenware container with reference to the metal cap with which it was connected.

35 A. Yes, that is right.

Q. Couldn't you determine the degree of movement at that time?

A. Possibly, if I had been interested.

Q. Then, you were not interested in determining that.

A. No, other than to know that such a movement existed.

Q. In other words, all you wanted to do was find whether or not there was a flex in the metal.

A. That is right.

Q. When you put pressure on the rimless jug—

A. There was a flex, yes.

Q. Now, as a matter of fact, would that compare with the conditions to which the jug would be subjected when in the assembled form in its commercial aspect and in use, tell us that?

A. That movement would be lessened when it is
66 assembled, because of the limitation of the movement by the packing material.

Q. And that movement, if the jug was in the assembled condition you refer to, would be practically infinitesimal.

A. I wouldn't say that, no, but it would be very slight.

Q. Why do you make that statement, "You wouldn't say that"?

A. Because there is no way of measuring it.

36 Q. Then, as a matter of fact, it is so infinitesimal you couldn't find it.

A. You have no way of measuring it after it is assembled. It is a principal of engineering and physics that any body suspended in a pendulous position and swung and suddenly stopped, there will be a slight pendulous movement of that body, depending upon the flexibility of its support.

Q. What effect would that pendulous movement of that earthenware crock have on the—

A. Why, continuous pendulous movement of a fair degree would tend to weaken and possibly rupture a bonding material so that it would not be waterproof. It is therefore desirable to limit that movement and to retain the

waterproof characteristics of the intervening bond between the jacket and the container.

Q. How do you limit that movement?

67 A. By this comminuted packing material.

Q. But you said a few minutes ago that was not packed hard enough to do that. How do you reconcile your answer to that previous statement?

A. I am talking of a completed jar when I talked just a minute ago here.

Q. You are talking about the commercial jar of the Mantle Lamp Company, aren't you?

A. Yes.

37 Q. And in that jar that comminuted material is packed without any degree of special thickness or density, isn't it?

A. No, it is packed with a certain degree of density.

Q. Is it tamped down?

A. Yes.

Q. It is tamped down in what way?

A. Why, men shove it down with their hands.

Q. And they get it so compact, do they, that the comminuted material itself will hold that earthenware crock from any lateral movement.

A. No, they limit it, but not hold it.

Q. What do you mean by limit it? What is the limitation of the movement?

A. It is a difficult matter to express the relative movement.

Q. Mr. Davis, you have qualified as a mechanical engineer.

A. I have, yes; I am.

Q. And you have been discussing the plaintiff's structures and Plaintiff's Exhibit 6, which purports to

68 be the defendant's structure.

A. Yes.

Q. I want to know, if you please, why and how you have been able to determine any movement whatever in the jugs in their assembled form. That is what I am asking you about.

A. I have never determined it in the assembled form,

38 but I know as an engineer that it exists.

In Plaintiff's Exhibit 6, the principal path of heat conductivity is through the necks where the two ele-

69 ments are joined together. That is the outer jacket and the inner container. If you have a heated liquid

in the jug, the entire inner container is at a thermal potential from outside here. We will assume that the material or the contents of the container is heated relative to the atmosphere in which the container is positioned. If there is a difference in thermal potential between the two, the forces of neutraiization will work and there will be a gradual dissipation through every possible outlet, and because the top of the inner container with a full jar is practically as warm as the bottom, at that point you will always feel the outer container warmer at the top than you will at the bottom. The tendency of heat is to rise and you can always put your hands on the top
39 and it will be much warmer, so the greatest loss will be where the outer jacket is the hottest.

The heat rises and the restricted path of heat is through the crock up to the neck of the crock and it passes through the bond to the metallic neck of the jacket. That is one path. There would be another path in Plaintiff's Exhibit 6. From the entire surface of the inner container there is a slight heat transfer to the outer jacket where it is radiated, but the greater part of the heat is transmitted at the points where they join. That is very clear.

Every time when the inner container is filled with a
70 heated liquid by touching with the hand it is very easily determined where the greatest heat is, and it may be safely considered that the greatst loss is at the point where the outer jacket is the hottest, but other parts
40 of the outer jacket are warm. To a small degree the heat will go directly from the crock through the insulated filler material through side walls of the metalic jacket. There is a slight transfer, that is inevitable. Through the entire body of the outer jacket and the neck, those are the only paths of conductivity for heat in Plaintiff's Exhibit 6.

The corkage unit might cause a loss of heat. The bottom of the cork might become heated and it might be so made it could transfer heat to the cup cap surrounding it and therefore waste it, which would be the path that
41 way. The heat rising comes in contact with the stopper, being metal, and in contact with the cup, the heat would transfer from the stopper to the cup and from the cup then down to the threaded neck of the container with which the cup is engaged, and it would transfer generally throughout its structure.

Q. Will you kindly examine Plaintiff's Exhibit No. 1,

being the copy of the patent in suit, and state whether or not you find in the specifications of that patent the word "pendulous"?

A. That is difficult for me to read. May I read from mine?

The Court: Do you want it, or are you asking the
71 witness?

Mr. Cromwell: Yes, I am asking him to point it out.

The Court: It is in 5 and also in 7.

Mr. Cromwell: I am asking about the specification.

The Witness: It is in 5.

Mr. Cromwell: I am asking if it is in the specification.

A. I haven't examined the entire specification, whether it is there or not, I don't know. Page 2, line 30 says: "This substance is packed with sufficient density to prevent violent pendulous movement of the container occasioned by shock administered from without the receptacle."

42 Q. Is that the only place where that occurs?

A. No.

Q. Where else?

A. In the claims.

Q. I said in the specification.

A. The original question was in the patent.

Q. I asked you in the specification.

A. You changed the question.

Q. No, I did not. I asked specifically in the specification.

A. May I have the question read?

The Court: Well, that might give you some satisfaction, but it wont be of much help.

A. I find it in that place.

72 Mr. Cromwell: Q. You don't find it in any other place then, except that point, do you?

A. I haven't as yet, no. That is the only place I have determined it.

Q. At the point to which you have called attention, it says that this substance is packed with sufficient density to prevent violent pendulous movement?

A. Yes.

73 In packing we force the comminuted material into it with our hands so that it is relatively tight, so

that it will afford some protection against the pendulous
43 movement. That is what is meant by the language there.
The temperatures that are usually found in these jugs depends on whether hot or cold contents are placed in them.

Q. Let's take the hot. What is the maximum temperature of a substance that you would put in there if liquid?

A. It would have to be under 212 degrees, as near boiling as practical. If you want to keep the contents for a long period of time, I suppose it should be as hot as possible when it is introduced

Q. What I am trying to bring out is you don't get excessively hot temperatures from the contents?

A. Well, hot is not a definite expression. I don't understand you. As to whether I call 212 degrees, the boiling point, excessively hot temperature, relative to water
44 it is hot.

Q. I say excessively hot.

A. Normally hot.

Q. Excessively hot.

A. I don't understand your "excessively hot" characterization.

Q. You could have temperature of four or five hundred degrees in some substances?

A. That would not be excessive. Four or five
74 hundred degrees is a low temperature relative to some objects but with reference to what I put in this jug, yes, that is out of the question.

Q. That is excessively hot?

A. It cannot be done.

Q. So, as a matter of fact, when you put contents in there of 212 degrees you are not putting an excessively hot temperature in there, are you?

75 A. As hot as it can be put in.

Q. I say excessively.

A. Your Honor, to an engineer the words "excessively hot" are not understood.

The Court: If you can't understand it, you can't answer it.

A. I work with 2000 degrees and 3000.

Mr. Cromwell: Q. What can't you understand about the question?

A. If you would refer to specific degrees in Fahrenheit, I could answer.

Q. I did. I said 212 degrees.

A. 212 degrees is hot for water.

Q. But not excessively hot for a substance that would go in that jug.

A. It is normal. That is what the jug is designed for.

Q. But not excessively hot?

A. No.

Q. That is what I have been trying to get you to explain.

The word "bond" in lines 61 to 72, page 1 of the specifications of the Blair patent in suit, means an intervening, interlocking element which joins two bodies together. In figure 2 of the drawing of this Blair patent I believe the bond is indicated there by numeral 14. This bond is supposed to be a low conductor of heat. The bond is formed of a similar material that is disclosed and covered in the Simonson and Blair patent. The material has been changed.

In the passage of heat from the conductor, 11, to the outside shell, the lip, 6, is almost in contact with the upper extremity, 13, of the inner container and it is barely possible that a certain amount of loss develops at that point because of either direct contact or the very narrow separation. I have not made any test specifically for determining that purpose. Of the total loss of heat of the container, I venture that fully half of the total loss of heat exists at the neck of the two, and that loss would go through the bond of low conductivity. If lip, 6, was in direct contact with the inner container possibly more would go through that way than would through the bond. The amount of the bond between the lip and the upper neck of the container is relatively small. As compared with the bond itself, I would judge there would be a greater heat loss there at the lip, under those circumstances. I said half would be lost at the neck. I didn't specifically state that half would be through the bond. It would be my opinion that half of it would go through the bond, because of the exposed area there, and possibly another half through the lip, but that would be a conjecture, a guess on my part.

With reference to the filler in the jug, Plaintiff's Exhibit 6, between the necks, is largely sulphur. Whether other ingredients have been added to the sulphur, I couldn't state, but I have determined this is substantially sulphur by burning some of it. The charac-

teristic sulphur fumes and smell is evident. As to whether I intend to convey by that expression "largely sulphur" that there was something else in it beside sulphur, there may be; not to my knowledge. As to whether, so far as my understanding of that filler is concerned, it is only sulphur, I didn't make a chemical analysis other
49 than to determine the principal ingredient of the bond was sulphur. I didn't say it was sulphur. To determine whether that was all sulphur a careful chemical analysis would have to be made. Impurities might exist with the sulphur. Sulphur is derived from ground, one of the elements of the universe. It is classified as a mineral substance.

The material of which the bond of the Mantle Lamp Company jug is derived is organic, largely the base of it is resin known as shellac. Differences in the two bonds could be set up, one being an organic substance and the other being inorganic.

In the jug, Plaintiff's Exhibit 6, one groove is all I
50 find in the neck. The sulphur has penetrated that groove, interlocked with it and in that respect the sulphur has a rigid fixed relation to the neck of the crock.

78 In figure 2 of the drawing of the Blair patent in suit, there is no groove in the neck of the container, 11 and the bond is shown only in contact with the outer surface of the neck.

Besides plaster of paris and these synthetic substances used as bonds, there is a material disclosed by Simonson and Blair that is a synthetic material. There are
51 many other resins. Litharge could be used as a bond. May I make myself clear on this point? A bond used between these two jackets becomes a bond when it interlocks. Plaster of paris and sulphur have the tendency of cleaving from smooth surfaces and on a smooth surface they wouldn't function as a bond, but when positioned between threads of the outer jacket and positioned between inner walls or recesses of the container it interlocks and then functions as a bond. The bond of the Blair patent has the characteristic of also being a seal. The purpose is to preclude the entrance of moisture to the comminuted packing material between the inner container and the outer jacket and that entrance would be very definitely detrimental to the insulated material between the outer jacket and the inner container. In the

bond of the Blair patent it is essential to exclude moisture to have a commercial device.

52 79 If some material other than sawdust were used as insulating body between the container and the jacket, the question of whether or not moisture would be present would affect the insulating qualities of that material. No moist material is as good an insulator as a dry material. The reason for that is, that water transfers heat very readily, a very fair conductor of heat. It is very definitely the aim of this bond of the Blair patent, not only to tie these parts together at the neck, but also to exclude moisture at that point.

Q. Mr. Blair, is there any difference in the relative conductivity of the bond that is used in the Blair patent in suit and the material of the container 11?

A. Are you addressing the question to me?

Q. Yes.

A. You spoke to me as Mr. Blair.

Q. Pardon me, Mr. Davis.

A. The question I didn't listen to.

(Question read by the reporter).

A. Material where?

Q. Material of the neck 11, the neck.

53 A. I consider that the organic material is a better insulator than the sulphur, more desirable as a bond in that type of device.

Q. I don't think you have answered the question, Mr. Davis. Will you read the question.

(Question read.)

80 Q. You didn't get the question, Mr. Davis.

A. Pardon me?

Q. I am asking you as to whether or not there is any difference in the relative heat conductivity of the bond of the Blair patent and the material, the earthenware, of which the container, 11, is formed?

The container, 11, is glass, which has very low heat conductivity and the bond, 14, also has a very low heat conductivity. They would both be considered heat insulators. I have made no test as to the relative heat conductivity between the glass of this Blair bottle and the bond, 14. Such tests wouldn't mean very much, because

54 there are many types of glass. I know that these two substances are both relatively poor heat conductors. I have never made tests between these two substances.

In the change that has been made in the bond in the

Mantle Lamp Company jug, between the neck of the jacket and the neck of the container, there is no physical difference between that substance and what is set forth in the Simonson and Blair patent, just a cheaper bond used. The original bond was rather expensive. That material is very slightly elastic, yielding, not to any degree. It does have very small yielding qualities, possibly a slight amount. I never tested it to find the degree of elasticity.

55 81 *Redirect Examination by Mr. Millar.*

Q. Mr. Davis, will you examine the Blair patent and tell us whether or not, in your opinion, the patent is limited to the use of the particular bond described in the Simonson and Blair patent?

Mr. Cromwell: I think that is a question for the Court to determine as to the limitations of that patent, not for this witness to explain.

The Court: Let him answer. Overruled.

Mr. Millar: You have been examining him about it all the time.

A. In the claims, the first few claims I have read, I find no characterization of the bond other than bond material, no specific description of the bond as such.

Q. Mr. Davis, will you kindly examine page 2, line 72, and thereafter, and tell us whether or not after having read those few lines, you consider that the Blair patent is limited to the particular bond described in the Simonson and Blair patent?

Mr. Cromwell: I offer the same objection, your Honor.

The Court. Overruled.

A. In the lines referred to I see the statement that the bond disclosed is preferably a type fully described in United States Letters Patent No. 1,309,967, and

56 82 that this particular bond is especially useful inasmuch as it may be fused in situ at a temperature lower than that of glass. As to whether, in view of the use of the word "preferably" in line 73, I consider his bond limited to the Simonson and Blair substance, I interpret those words that the inventor desired to use the bond disclosed, a type which he considered preferable for the work.

Mr. Cromwell: I move to strike out the question and the answer as a conclusion.

The Court: Let it stand.

(Recess until 2:00 o'clock.)

57 83 PEARL H. BRAINARD, called as witness on behalf of Plaintiff, testified as follows:

My name is Pearl H. Brainard. I live at Monmouth, Illinois. Am a manufacturer of poultry supplies and prior to 1920 I was a manufacturer of poultry supplies, manufacturing poultry fountains and feeders including chicken waterers. The chicken waterer was made with an inner container of steel. The wall between was packed with shavings to insulate it.

58 Q. With whom were you connected in the year 1920?

A. Well, I just don't remember the dates.

Mr. Cromwell: If the Court please, may the witness answer just a little louder?

The Court: Speak a little louder, Mr. Witness.

A. I can't remember the date at that time, where I was. At the time I made insulated chicken waterers, I was connected with the American Steel Products Company of Monmouth, Illinois.

Q. Did you ever live in Monmouth?

A. I mean Macomb, instead of Monmouth. I was associated with the Macomb Manufacturing Company in the capacity of President. The same Macomb Manufacturing Company that was a party to the suit of The Mantle Lamp Company *vs.* the Macomb Manufacturing Company. In addition to the manufacture of poultry furniture, the Macomb Manufacturing Company made insulated jugs. I do not recall when they began to
84 manufacture insulated jugs—not the date. I was associated with the Macomb Manufacturing Com-
59 pany when they began to manufacture insulated jugs. I refer to heat insulated receptacles.

The first heat insulated receptacles manufactured by the Macomb Manufacturing Company, the inner jacket was made of earthenware. The interior of the earthenware container was glazed white, had a groove in the neck, a steel breast was drawn around in this
85 groove and solderd along the edges; the body of the steel jacket was attached to the breast and in-

sulated with cork. It had a stopper, cap and bail. As to whether there was any material in contact with the neck of the container at the slot, other than the jacket, I don't believe I know what you mean. As to whether I can draw up a picture of the container or have drawn up such a picture, I have. I drew this, this morning.

60 I have marked the breast with the letter "A", the slot "B" and the container "C". No other material was disposed between the breast and the container at the slot. The steel breast was merely contracted into a slotted neck.

61 (Document received as PLAINTIFF'S EXHIBIT 8.)

62 I did not testify in the case of The Mantle Lamp Company of America *versus* the Macomb Manufacturing Company, tried in the Federal Court in Springfield, Illinois, nor in the case of the Therm-A-Jug Company and the Monarch Company *versus* the Mantle Lamp Company of America, tried in the United States District

86 Court in Chicago, Illinois. I did testify in the case of The Mantle Lamp Company of America *versus* George H. Bowman Company tried in the Federal Court in Cleveland. The Macomb Manufacturing Company manufactured and sold about fifteen hundred heat insulated receptacles of the type shown in Plaintiff's Exhibit 8. They continued to manufacture jars as shown in Exhibit 8 through the summer of the first year they started, and thereafter continued to manufacture heat insulated receptacles.

In the heat insulated receptacles manufactured by the Macomb Manufacturing Company, the inner container

63 was made of earthenware, with a steel jacket. The neck was extended over the top of the earthenware container. The neck had a cam-screw shape and there was cement bond poured in between the steel jacket and the earthenware container. There was insulated cork between the walls of the container and the jacket. The bond was plaster paris and Portland cement.

Q. Did the Macomb Manufacturing Company thereafter make any changes in the construction of the heat insulated receptacles which they were making?

A. Do you mean after that time?

Q. After the type you have last described.

A. I wasn't there after that.

Q. You were not there?

87 A. No, I was not connected with the firm after that.

Q. How effective, or how efficient did the bond made of Portland cement and plaster of paris prove to be?

A. I don't believe I can answer that, any more.

Q. You don't know?

A. It has been so long since.

Q. Can you describe a little more particularly the neck of the container with reference to any irregularities that may have appeared on the outside thereof?

A. I don't believe I know what you mean.

Q. Was it a smooth surface on the outside of the neck of the container?

A. That was a threaded neck.

64 Q. How about the neck of the jacket?

A. Well, that is what I mean; it was a threaded neck, on the jacket. There were irregularities on the neck of the container. The container had some grooves in it, one or two, I don't remember which. Circumferential grooves running around it.

Q. Tell us the position of the bond with reference to the necks, and particularly with reference to the screw threads on those grooves?

Mr. Cromwell: I object to the leading type of this examination. You are certainly putting it into his mouth when you are talking about the construction, as you have in the last question.

88 The Court: Overruled.

A. This cement in liquid form was poured in around the neck, and formed in the screw on the neck, and the grooves on the inner container.

As I remember it, I left the Macomb Manufacturing Company in 1925. I don't remember how many of the

65 second heat-insulated receptacles of the type I have last described were manufactured and sold by the Macomb Manufacturing Company up until the time I left. I don't believe I do have any idea on the subject, unless the second year, the second year there were probably 50,000 made. Beyond that, I don't remember. Probably 50,000 the second year. As to how efficient I found this second type of heat insulated receptacle to be, as compared with the first one, if you mean how long it would hold the

temperature, from memory I just don't know. You know it has been so long ago.

Q. Can you tell why the manufacture and sale of the first type, the type found in Plaintiff's Exhibit 8, was discontinued?

A. It would not hold the heat as long as the second type.

89 *Cross-Examination by Mr. Cromwell.*

At this time I was engaged in the business of manufacturing poultry supplies. I am located at Monmouth,
66 Illinois. I am manufacturing as a company, as an Illinois corporation. The name of my company is Vac Manufacturing Company.

As to how long I have been engaged in the manufacture of the poultry supplies down there, I started in Macomb in 1907. Referring to Monmouth, I think I moved there in 1925 from Macomb and started at that time.

I was President of the Macomb Manufacturing Company. I don't remember how long I was president. As president of the Macomb Manufacturing Company I was, at that time, acquainted with the employees.

As to who it was that made these jugs that I say were made as the first jugs, I designed the jug. I did not make the jug. The workmen helped me. I don't remember who the workmen were who did that. That is so long ago. I don't remember what year it was when these jugs were first made.

Q. Didn't you testify in that Bowman case that it was in 1921.

A. I don't remember that. As I remember, it was 1920, but I am not sure, I can't just recall.

67 Q. In your examination in the Bowman case you
90 were asked this question:

"Q. When, if you know, did the Macomb Manufacturing Company start the manufacture of heat insulated receptacles of the non-vacuum type?"

and your answer was:

"A. 1921, I think."

Was that a correct statement?

A. I don't know now. I just don't remember that date. It has been several years ago.

Q. Didn't you know at the time you gave this testimony?

A. I expect I looked at the records.

Q. That 1921 was the date that you testified to?

A. I expect I looked up records, but I have forgotten about that.

Q. How many workmen were employed at the Macomb Manufacturing Company in making these jugs in 1921?

A. I don't remember.

Q. Were you not acquainted, as President of that company, with working conditions and the force down there?

A. I was at that time, but it has been so long ago I have forgotten about that, how many men were there.

Q. What circumstance caused you to testify in the Bowman case?

A. You mean why did I testify?

91 Q. Yes.

A. Mr. Johnson asked me to testify.

68 Q. And what did Mr. Johnson say to you when he asked you to testify in the Bowman case.

A. That—I don't remember anything in particular.

Q. You don't remember any of the conversation at all?

A. No, sir.

Q. Have you any understanding with the Mantle Lamp Company that you will get a license to manufacture under this patent if it is sustained?

A. No, sir.

Q. This Blair patent?

A. No, sir.

Q. Was any consideration paid to you for testifying in that Bowman case?

A. Expenses.

Q. Where was that testimony taken?

A. Cleveland, Ohio.

Q. And you went from Monmouth to Cleveland to testify?

A. Yes, sir.

Q. No inducement was held out to you by the Mantle Lamp Company for that testimony?

A. No, sir.

Q. What caused your separation from the Macomb Manufacturing Company?

A. Well, I don't know exactly what it was.

Q. Were you not asked to resign by your Board of Directors?

92 A. I think I was froze out of the company, yes.

Q. What do you mean by that?

A. I was voted out.

Q. And what was the circumstance by which you were voted out, do you know.

A. No, sir. They wanted to get the royalty, I think, as near as I found out.

69 What royalty do you refer to?

A. I was getting a royalty on a patent on the jug at that time, and they wanted it; either that, or to eliminate the royalty, I don't know which.

Q. You mean they were manufacturing a jug under some patent or patents, of yours?

A. Yes, sir.

Q. And you were being paid a royalty for it?

A. Yes, sir.

Q. And they wanted to get you out, so they would discontinue that royalty, is that it?

A. I think so.

Q. Did you have any contract with them as to the payment of that royalty?

A. I did.

Q. Was that contract in writing?

A. Yes, sir.

Q. How long did that contract continue?

A. I don't remember, any more.

Q. When did it begin?

A. I don't remember that date. The date, when we started to make them.

Q. I call your attention to United States Letters
93 Patent 1,489,059, dated April 21, 1924, to Pearl H. Brainard, of Macomb, Illinois. Please examine that patent, and say whether or not you are the Pearl H. Brainard to whom that patent was granted.

Mr. Millar: If you Honor please, I object to that, unless it is going to be marked for identification, or offered in evidence.

70 Mr. Cromwell: I will come to that in due time.

Mr. Millar: That is my objection.

Mr. Cromwell: He spoke about manufacturing these jugs, your Honor, and he has made a sketch, and this is for comparative purposes.

Mr. Millar: I will withdraw my objection.

The Witness: A. Yes, sir.

Mr. Cromwell: Q. Was that the patent, or one of the patents which you had the license agreement under?

A. That is one of them.

Q. I will call your attention to United States Letters Patent 1,477,101, dated December 11, 1923, and granted to Pearl H. Brainard, of Macomb, Illinois. Please examine that patent, and state whether or not you recognize that patent.

A. Yes, sir.

Q. Are you the Pearl H. Brainard to whom that patent was granted?

A. Yes.

Q. And did this patent figure in that license agreement also?

A. Yes, sir.

94 Q. Now, was the construction disclosed in Patent 1,477,101, the one that succeeded the construction disclosed in patent 1489059?

A. Let's see. You mean this one? (indicating).

Q. Yes.

A. Yes, sir. This was the later one.

Q. Yes.

71 A. I think that is shown for the mode of assembling.

Q. Now, will you look at Plaintiff's Exhibit 8, and the drawings of Patent 1,489,059, and compare the two structures there; and I ask you whether there are any differences.

A. I did not draw the handle, is all. It shows the grooves. That is what I was trying to draw.

Q. Then, barring the handle, or the bail of the jug, the manner in which the top of the shell is connected to the earthenware crock is the same in the sketch marked Plaintiff's Exhibit 8 as in Patent 1,489,059?

A. As near as I could draw it, yes.

Q. Were there any constructions made by you between the time that the construction of this sketch marked Plaintiff's Exhibit 8 was produced, and the structure of this Patent 1489059?

A. You mean beween these two? (Indicating).

Q. Yes.
A. I don't remember that.
Q. Did you change the structure at all?
A. Not until it was changed from this to the other one.
Q. Changed from what to what?
95 A. To this type (Indicating).
Q. That is the one in Patent No. 1477101?
A. Yes.
72 So what you did was just to produce this which was shown in Patent 1489059, and then, without any change in any other structure at all, or producing any other structure, you went over to what is shown in Patent 1477101, is that right?
A. Yes, sir.
Q. Now, what was the occasion, Mr. Brainard, of changing over to this form of jug that is shown in Patent No. 1477101?
A. Well, this was sort of hand-made, and it was changed over to this one here, because we could stamp that out, and get a bond in here (indicating). This other, we had no way of doing this by hand.
Q. What were your duties as president of the Macomb Manufacturing Company?
A. I operated the plant in those days. We didn't have many workmen.
Q. Didn't you, as a matter of fact, conduct the sales policies of the Macomb Manufacturing Company?
A. I conducted the sales, yes.
Q. Weren't you on the road a great deal in pursuance of that?
A. Some of the time; part of the time I was in the factory.
Q. And when you were on the road, did you find any instances of other jugs of this type that were being put
96 out by other manufacturers?
A. You mean of this first type?
73 Q. After the first type was developed.
A. The second?
Q. Yes.
A. I think there were some on the market, but I just can't recall much about that now. I think they all came out about the same time, as I remember it.
Q. Didn't you go back to your factory, as a matter

of fact, and tell your employes that they had to have a better jug than the one shown in your first patent?

A. No, sir. I wouldn't tell them. I would get it out myself.

Q. You wouldn't tell your employees about it?

A. No; we very probably didn't have many to tell in those days.

Q. Did you have anyone to assist you in designing that particular jug that is shown in that second patent?

A. No, sir.

Q. You did that all by yourself?

A. Yes, sir.

Q. Who made the dies for the production of these jugs?

A. The Swayn Manufacturing Company, of St. Louis.

Q. Did the Swayn representative ever come up to your plant in connection with the production of these jugs and talk with you about them?

97 A. I don't remember that.

Q. You don't remember any trip at all?

74 A. I just don't remember, unless it was some repairs, or something; that I cannot answer.

Q. I think you said you made fifteen hundred of the jugs shown in that first patent, or as shown in the sketch, Plaintiff's Exhibit 8, is that correct?

A. As near as I can remember, yes.

Q. Over what period of time were those fifteen hundred made?

A. That was in the spring and summer of the first year of manufacturing, the summer season.

Q. And then did you continue the manufacture of that jug?

A. Yes.

Q. What did you make in 1922?

A. I just don't know the dates, but the second jug was this Patent No. 1477101, that was the second jug.

Q. That was the second jug?

A. Yes.

Q. Now, isn't it a fact that you made more than fifteen hundred of those first jugs?

A. I just can't tell exactly. That was just my guess, it has been so long ago, I have no records.

Q. Did you have any trade-name for those jugs when you first put them on the market?

A. Well, I don't know whether it was on the first ones.

Q. Any trade-mark?

98 A. Yes, we had a trade-name, but I don't know whether it was on the first ones or not.

Q. What did you call them?

A. "Little Brown Jug."

75 Q. Were the first jugs you produced called that by that name?

A. I don't think the first ones were, no. There were some made; how many, I don't know.

Q. Did you make any of the "Little Brown Jugs," such as shown in that first patent, in 1923?

A. I rather thing that we commenced the name of that in the middle of the season sometime.

Q. No, I am asking you whether or not you made jugs like shown in the first patent there, and, likewise, as shown in this sketch, Plaintiff's Exhibit 8, in the year 1923?

A. We only made them the first year, and I just don't remember the first year we started.

Q. Then, as I understand it, you made the fifteen hundred jugs in the year 1921; and in 1922 and 1923, you did not make any more of that type of jug?

A. We made it the first year, we made this type here (indicating).

Q. That is, on the first patent?

A. Whatever date that was. Then we never made it after that.

Q. You never made any more of those afterwards?

A. No.

Q. I think you said you had difficulty in anchoring, or making fast the top of the jug, that is, the metal container, the metal jacket, in the groove in the

99 neck of the earthenware crock or container. What was the reason for that?

A. It had to be put in there by hand.

76 Q. What was the form of the cement that you put in? Was it the Portland cement you referred to? I think you said that.

A. The first ones we made, we did not cement, we filled up around the top of the breast, because the jug was rough around there. We didn't commence to cement until the second year.

Q. Did you change the form of that joint at all?
A. The second year? Oh, yes, we changed the material.
Q. I mean, with respect to this first jug that you made in 1921.
A. Well, the second jug was nothing like it.
Q. I am talking about the jug you made in 1921, which you said was the first jug you made.
A. Well, I don't remember the date. The first jug we made had no bond, only just the cement around the top, of the breast, to cover up the roughness of the jug.
Q. You said you had difficulty in making that hold fast, didn't you?
A. Yes, that's right, we did.
Q. Did you make any other change at that point in that particular jug?
A. No.
Q. To make that joint fast?
100 A. No, we didn't. We might have changed in the kind of cement used, I don't remember about that, whether it was Portland cement or not.
Q. But you did not change the point of application of the cement at all, did you?
A. Not that year, not the first year.
77 Q. Did you do it in the second year?
A. We made a new type of jug.
Q. Yes, that's what I thought.
A. Yes.
Q. I believe you said you had fifty thousand jugs altogether. What did those fifty thousand jugs include?
A. Well, I estimated it; I don't know whether that is the exact amount, but as near as I can remember, the second year we made fifty thousand.
Q. The second year?
A. Yes.
Q. That was the year 1922?
A. That I don't remember, the date. It was the second year of manufacture.
Q. While you were president of the Macomb Manufacturing Company, did you sell out to Hemp & Company?
A. No. That was after I left there.
Q. Hemp & Company acquired the business of the Macomb Manufacturing Company, didn't they?
A. Yes, they have, so I heard.

Mr. Millar: I object, if your Honor please. Not cross-examination.

101 The Witness: A. (Continuing) That is only what I hear. It is hearsay. They are operating it, as I understand it, now.

The Court: What is the objection?

Mr. Millar: Who they sold out to is not material here; and even if it were material, that is not a proper way to prove it.

Mr. Cromwell: I am endeavoring to establish the
78 status of this witness. I think I have a right to test this man's credibility, and so on.

The Court: Let him answer.

Mr. Cromwell: Q. What was the answer?

(Answer read by the reporter)

Mr. Cromwell: Q. I was talking about the time that you were with the Macomb Manufacturing Company.

A. Pardon me.

Q. You left before they went out of business, is that it?

A. Yes, sir.

Q. I wish you would explain just a little more fully the conditions under which you testified in the Bowman case, and how you were asked to give that testimony.

A. I just don't remember how that was any more. Mr. Johnson asked me if I would go down to Cleveland and testify, that's all I remember. I used to manufacture jugs. That's all I recall any more. There was nothing in particular that I know of.

Q. You mean Mr. Victor Johnson sitting here, this gentleman?

102 A. Yes.

Q. He asked you, did he?

A. Yes, sir.

Q. And you went down and testified?

A. Yes, sir.

Q. What did Mr. Johnson say to you about the facts of this development of yours? Did he say anything?

A. Not that I remember of, anything in particular now.

79 Did he ask you, as a matter of fact, whether or not your jug was giving satisfaction?

A. No, sir, I don't think so; I don't think that he did.

Q. Did he ask you anything about changing over to

the type of jugs shown in the second patent that I showed you?

A. No, sir.

Q. Just ordinarily approached you, without any suggestion at all of what he wanted to ask you, or what you would testify about?

A. I remember nothing in particular he asked me any more.

Q. You did not indicate anything until you got on the stand down there, did you?

A. Not that I remember.

Q. As to what your developments were in jug making, and the sales of those jugs?

A. Not that I remember of.

Mr. Cromwell: That is all, your Honor.

103 I did not testify in the case of The Mantle Lamp Company *versus* the Macomb Manufacturing Company, tried in the Federal Court in Springfield, Illinois.

94 I did not testify in the case of the Therm-A-Jug Company and the Monarch Company *versus* The Mantle Lamp Company, tried in the District Court in Chicago, Illinois.

I did testify in the case of The Mantle Lamp Company of America *versus* George H. Bowman Company, tried in the Federal Court at Cleveland, Ohio.

Cross-Examination by Mr. Cromwell.

My present business is life insurance. I am not a practical glass worker. I tried to make bottles myself. I did not succeed. You know you experiment around a factory, you like to do the work. I depended upon the skilled glass worker to make the bottles when I was with the Icy Hot Company.

95 Thermos bottles, so-called, are being sold today. Those Thermos bottles, consist of the interior receptacle formed of the double wall evacuated bottle, within the metal container.

The Icy Hot Bottle Company went out of business the latter part of 1924; There was a merger effected between ourselves and the American Thermos Bottle Company, and I retained my interest and became vice-president of the American Thermos Bottle Company.

104 *Redirect Examination by Mr. Millar.*

79 I can't tell exactly for how long a period I have known Victor S. Johnson. For a number of years. May be ten years. I knew him prior to the time he asked me to come to Cleveland and testify. I don't remember for how long a time prior to that, several years. I don't
80 know exactly. As to whether I had relations, business relations with him, just meeting him is all. I knew him as a competitor. I happened to be here to testify today because Mr. Johnson asked me. He called me up and asked me to come here and testify.

Before I testified in Cleveland I think I did talk to you about it but I don't remember the conversation and I talked to you today about it.

My attention being directed to the two patents to which Counsel has called my attention and being asked to examine the one numbered 1,489,059, with particular reference to the date the application was filed, that filing date is December 29, 1921 and looking at the other one numbered 1,477,101, that is a smaller number than the other number. The filing date on the one with the smaller number, is January 25, 1923. Yes, the patent with the larger number was filed before that one with the smaller num-
81 ber. One was filed in 1921 and one in 1923.

Q. Which of those has the smaller number?

105 A. 1921.

Q. No, the number of the patent up here in the right-hand corner.

Mr. Cromwell: I submit, your Honor, the patents speak for themselves in that respect.

Mr. Millar: All right.

The Court: Sustained.

Mr. Millar: That is true. It does speak for itself.

The Witness: 1923 has the smallest patent number.

Mr. Millar: All right. Now, on examination of those two filing dates, does that refresh your recollection with respect to the dates you began the manufacture of heat insulated receptacles of any kind?

A. I don't know whether it was filed the same year we started to manufacture them, or the next year.

It was about that time, but I don't remember the dates.

My attention being called to Patent 1,489,059 that was my idea of what an efficient heat-insulated receptacle would be on the date I filed my application.

My attention being directed to Patent 1,477,101, that was my idea on January 25, 1923, of what an efficient heat insulated receptacle should be.

82 106 FRANK C. TERRY, a witness called on behalf of the plaintiff, testified as follows:

My name is Frank C. Terry. I live in Cincinnati, Ohio. Right now I am in the insurance business; have been about a year and a half. Prior to that time I was a manufacturer of vacuum bottles. Have been engaged in the manufacture of vacuum bottles since the spring of 1908, up until about two years and a half ago. During that time I was associated with The Icy Hot Bottle Company, the American Thermos Bottle Company, and the
83 Keapsit Bottle Company. Vacuum bottles were first placed on sale in America in 1906. Had no connection with any vacuum bottle manufacturer in 1906. In 1908 I was associated with The Icy Hot Bottle Company of Cincinnati. I knew George P. Altenberg, president and founder of the Icy Hot Bottle Company.

The vacuum bottle manufactured by the Icy Hot Bottle Company in 1908, was a glass bottle blown into another glass bottle and welded at the neck. Then a bottom was formed by heating the outer glass bottle, and forming a bottom. A hole was left in the outer bottle, so that it could be attached to a vacuum pump; the air was pumped out of the space between the two glass walls. That was what was known as the filler. After the vacuum was pumped out, the glass filler was then inserted into a metal outer container. At that time, we anchored
107 the glass filler at the neck by cementing it with this
84 white substance, plaster of paris. At the bottom, there was a fiber pad to rest the filler on. The glass was welded at the neck. That was accomplished by putting it onto the fire, and forming the neck, and when the glass was soft, naturally it would weld together. The cylinders out of which the outer and inner glass containers are made in a vacuum bottle are called pistons. I couldn't tell you exactly how thick is the glass of which the pistons is made, but it is very thin glass, much thinner than any common table-ware, or even high grade table-ware.

The George P. Altenberg, to whom United States Letters Patent No. 900075 were issued, dated October 6, 1908, is the same George P. Altenberg with whom I was associated in business.

That patent describes the vacuum bottles manufactured by the Icy Hot Bottle Company in 1908 and thereafter.

85 The experience of the Icy Hot Bottle Company, with reference to plaster of paris around the neck of the vacuum bottle, between the outer wall and the metallic casing, was very unfortunate. Plaster of paris would not adhere readily to the glass or the metal; it would crumble, causing the filler to drop down into that felt pad, where it rested. Then, when anybody poured 108 water into the bottle, to use the bottle, or when they would immerse it into water, to wash it, the water would seep down between the glass filler and the outer metal casing, and it would create a terrible odor.

On the outside neck of the outer piston, there was no groove or corrugation in the glass. The complete filler in a vacuum bottle, of a pint, was around eight ounces.

The Icy Hot Bottle Company continued to manufacture vacuum bottles of the type just described, up to 86 about 1911. They then changed their type of vacuum bottles. We eliminated the plaster of paris at the neck and made the outer metal cases with a removable bottom. Then we inserted the glass filler through the bottom, placed a rubber ring at the neck of the glass filler, pushed it up and kept it in place by a tripod metal spring at the bottom, consequently, when you put the bottom of the outer metal case onto the outer metal case, the spring would hold the filler tight up against that rubber gasket at the neck. The Icy Hot Bottle Company continued to make vacuum bottles of the type I have last described up to 1924.

In the year 1917 or 1918 experiments were made by the Icy Hot Bottle Company in an effort to produce a 109 large size vacuum bottle. We were very anxious to produce a vacuum container of one gallon or more, principally because we wanted the Government to adopt them for army use; we had some glass pistons made of the larger sizes and started to experiment in the making of a large glass vacuum filler. We found that the glass blowers, then men in our factory who would heat the glass and shape it the way we wanted it, every time they

87 drew the bottom of the outer glass piston, they would get it down so thin that the thing would collapse in their hands, just like egg shells. We continued those experiments for some time and found that we could not make a commercially satisfactory vacuum container of one gallon capacity, so we never even submitted the samples to the Government. We did not conduct any other experiments at that time, endeavoring to make a larger insulated receptacle. We had that in mind. There were a lot of experiments, all with the view of making a gallon or larger size container.

The type of jars or vacuum bottle that had been sold by the Icy Hot Bottle Company prior to 1920, for picnic use, was the quart size bottle. We pushed that particular size bottle for picnics and automobile outings.

88 The sale of the quart bottle, in 1921, started to go down. I first saw a heat insulated receptacle of non-vacuum type the latter part of 1920. I bought it for 110 the factory. It was the Aladdin Jug, made by The Mantle Lamp Company of Chicago. We took it up to our experimental room and tore it apart. We wanted to see what they had, whether we could go into making a similar jug, because they were poaching on our sales. Thereafter the Icy Hot Bottle Company made a heat insulated receptacle of the non-vacuum type.

89 We tore apart the Aladdin Jug, saw what they had put in that space between the two containers and decided to go right ahead and make one similar to it. The difference was that we made the non-vacuum gallon jug similar to the Icy Hot Bottle; we took the inner container, put a heavy rubber ring around the neck, and then pushed that up and rested the inner container on a metal tripod spring which rested on the bottom of the outer container.

Between the walls of the container and the jacket we used several kinds of material, but finally decided on chipped cork, or ground cork. There was nothing else 90 around the neck of the bottle, except that rubber ring. This jar would keep contents hot or cold between four and five hours.

The Aladdin Thermalware Jar manufactured by the Mantle Lamp Company of America with reference to its efficiency as a heat insulator, compared with that of the jar manufactured by the Icy Hot Bottle Company, in

actual test, kept things hot or cold between seven and eight hours.

111 I used the Aladdin Jug, a heat insulated receptacle of the non-vacuum type, for my own personal use in my own automobile.

The Icy Hot Bottle Company continued the manufacture and sale of the heat insulated non-vacuum vessel I have just described for about three and a half years. They are not now manufacturing them. They did not discontinue to manufacture them while I was still with them. They continued to make these jugs after the
91 merger of the Icy Hot Bottle Company with the American Thermos Bottle Company, the latter part of 1924.

In the manufacture of making a vacuum bottle filler there are two glass pistons required, like a water glass without a bottom; a cylinder. One is larger than the other. The smaller one is inserted into the larger one. The operator holds the piston in one hand, puts it over a gas fire, until it becomes soft. He shapes it with his little tool that he has, welds the two pistons together at the neck. He then turns it around, heats the bottom of the outer piston, shapes that into a round bottom, leaving a small hole and a glass tube is inserted then, so that the glass tube can then be attached to the vacuum pump and the air pumped out of the base between the two pistons. During this process of manufacture, he rotates the two pistons between his hands, while they are in the fire.

112 The percentage of breakage in the vacuum bottles
92 of the pint size, small size, would probably run around eight or ten per cent. That is only in the process with the glass blowers. That does not count the breakage in the pumping of it with pumps. The percentage of loss in drawing the vacuum would run about three per cent.

The percentage of loss in the manufacture of the vacuum bottle fillers, including the loss in drawing the vacuum, of a quart size bottle, up to the pumping operation, would run around twelve or fourteen per cent and about 2½ or three per cent on the pumps.

We made larger vacuum bottles than one quart, we found the breakage on the larger size to run up as high as forty and fifty per cent and more. The gallon bottles
93 are the ones I am speaking about. In the manufacture

of the larger size vacuum bottles, when the glass is in the fire, with a larger container like that, he has the flame working in one spot on that glass, when he turns it around and starts heating the other part of the glass, the part that he has already heated starts to cool off and cracks. When the glass is drawn by the glass blower, naturally he pulls more glass on a large container and makes the wall of the container that much thinner; it is as thin, almost, as an egg shell. I consider a vacuum bottle a very frail article.

113 I did not testify in the case of The Mantle Lamp Company *versus* the Macomb Manufacturing Company, tried in the Federal Court in Springfield, Illinois.

94 I did not testify in the case of the Therm-A-Jug Company and the Monarch Company *versus* The Mantle Lamp Company, tried in the District Court in Chicago, Illinois.

I did testify in the case of The Mantle Lamp Company of America *versus* George H. Bowman Company, tried in the Federal Court at Cleveland, Ohio.

Cross-Examination by Mr. Cromwell.

My present business is life insurance. I am not a practical glass worker. I depended upon the skilled glass worker to make the bottles when I was with the Icy Hot Company.

Thermos bottles, so-called, are being sold today. Those
95 Thermos bottles, consist of the interior receptacle formed of the double wall evacuated bottle, within the metal container.

The Icy Hot Bottle Company went out of business the latter part of 1924; there was a merger affected between ourselves and the American Thermos Bottle Company, and I retained my interest and became vice-president of the American Thermos Bottle Company.

114 We tried to make these large thermos bottles, or vacuum bottles in the gallon size and did not succeed. We then turned our attention to the making of these non-vac jugs. We made some of those and sold them. We continued to make those about three and a half years. I should say we made around 150 to 200,000 altogether.

I did not say on my direct examination that I made
96 about thirty-five hundred, not that I remember. That

might have been the first year when we started, but I know we went into production later on and made them by the carload. That was the bottle, or the jug, that had tripod support for the inner container, and that was the jug also in which there was a rubber gasket about the mouth of the earthenware container, formed the joint at the top with the metal outside casing.

That was the type we continued to sell and we made a hundred thousand or 150,000, approximately. That construction was not changed at all, not in that particular, so that throughout the manufacture and sale of these hundred or 150,000 non-vacuum jugs we had that inner container supported at the bottom by this tripod with a rubber gasket around the neck of the earthenware vessel.

I do not recall that we were notified of infringe-
115 ment by The Mantle Company of America of their patent when we are manufacturing these non-vacuum
97 jugs. As far as I remember, we continued to manufacture them unmolested by The Mantle Lamp Company during the period of their manufacture.

Everything I have said about the construction of this non-vacuum bottle or jug I have testified from memory. I have no records with me, no drawings before me, not even one of the bottles before me. I have one of those bottles today like I made. There must be one around the house somewhere. I don't know whether I have one. I suppose if it is necessary I could pick one up, because we sold some right here in Chicago.

In the Icy Hot Bottle Company we had a manufacturing end of it, and a sales organization and an engineer-
98 ing organization. We employed about 350 to 400 people in the factory, about sixty in the office and we had about thirty salesmen. We had one engineer, Lindahl, who was chief of our experimental department and he had three assistants, draftsmen and technical men, who would be given a problem to solve and whip into shape. Lindahl was killed, Walsh is alive, but I have lost track of him, and another one, whose name I cannot recall right now. I have the list at home. I suppose if necessary I could get you those names. Counsel for the Mantle Lamp Company of America have not asked me to produce one of these non-vacuum jugs that were manufactured back there.

Mr. Johnson contacted me in connection with my testi-

mony in this case. I have known Mr. Johnson for a
116 number of years Originally, when he asked me to testify in Cleveland he said, "Well now listen, Terry, you have been in the vacuum bottle game, you are a pio-
99 neer in this country, one of the first ones in this country. You know all about that, you know all about your jug. I have a suit on up to Cleveland. Can you run up to Cleveland." I said "Sure." So I jumped up there on the train, got there one morning about half past eight. At ten o'clock we were in Court, stayed there one day and then I went back to Cincinnati.

In this particular instance I received a letter from him and he asked me to get in touch with him by 'phone. I called him and asked him what was on his mind and he said "I have got another one of those suits on." "If you have got nothing special on, can you come up for it to Chicago when you are needed." I said "Yes." Last Saturday I got a telegram from Mr. Millar, at Cincinnati, telling me that this suit would be on Tuesday and if possible to get here. I got here yesterday around noon and here I am.

I got out of the vacuum bottle business the beginning of 1930. I had been associated then with the Keapsit Bottle Company, that was my own company. I did not go into the making of jugs or larger containers. Just specialized on pints and quarts and lunch kits.

100 117 BERT S. PRESBA, called as a witness on behalf of plaintiff, testified as follows:

Direct Examination by Mr. Millar.

My name is Bert S. Presba. I live at 1010 Maple Avenue, Evanston, Illinois. I am Vice-President of The Mantle Lamp Company of America. I have been an officer of The Mantle Lamp Company for twenty-one years. For the past fifteen years I have been director of advertising and sales for The Mantle Lamp Company. I am familiar with the articles manufactured and sold by The Mantle Lamp Company during that time. I am familiar with the heat insulated receptacles manufactured and sold by The Mantle Lamp Company of America.

101 I recognize both of the receptacles held in your hand.

They are both Aladdin Jars, manufactured by the Aladdin Industries, the associate company of The Mantle Lamp Company of America.

Considerable advertising has been done by The Mantle Lamp Company featuring these Aladdin Thermalware Jars, over a period of fourteen years. Some of the mediums in which advertising appeared are th Saturday Evening Post, Liberty Magazine, Ladies' Home Journal, Women's Home Companion, Good Housekeeping, Nature Magazine, and various outdoor publications, such as
Field & Stream, Sportsmen's Magazine, Outdoor
118 Life, and various trade papers, such as Sporting Goods Journal, Good Hardware, and three or four others, I don't just recall the names of.

During the last fourteen years Aladdin Thermalware Jars have been advertised and sold continuously, during certain seasons of the year. Not every month of the year, but each year continuously since 1920.

102 I know of my own knowledge approximately the amount of sales of Aladdin Thermalware Jars, about $2,400,-
103 000.00. The amount spent in advertising these jars in the various publications and other mediums I have mentioned amounts to a little over $300,000.00. Other media of advertising used besides magazines and papers was radio advertising. It was done each season for the last five years, from probably twenty-five or thirty radio stations, averaging once a week from about October until February from each of those stations. Some of the better known stations from which such advertising was done are W.L.W. Cincinnati; K.D.K.A. Pittsburgh; W.H.O. Des Moines; W.L.S. Chicago.

(Plaintiff's Exhibits 9, 10, and 11 for identification, so marked.)

I have heretofore seen Plaintiff's Exhibit 9 for identi-
104 fication. I first saw it about April 1924. That is the type of trade paper advertising we have been doing. It ap-
119 peared in the Sporting Goods Dealer, shown on the heading of this reproduction, but it also appeared in three or four trade papers, such as Sporting Goods, Good Hardware and Drug Magazine, as I recall it.

I have heretofore seen Plaintiff's Exhibit 10 for identification. That appeared in Hardware Age, April 1924.

I hve heretofore seen Plaintiff's Exhibit 11 for identification. That is a broadside sent out to about 100,000

dealers, both drug and hardware, in which we make an announcement of the advertising that we are doing in
105 consumer magazines and present our sales' program. I mean by "broadside" a circular of advertising matter.

(PLAINTIFF'S EXHIBITS 9, 10, AND 11 offered and received in evidence and were marked Plaintiff's Exhibits 9, 10 and 11.)

106 *Cross-Examination by Mr. Cromwell.*

I said we spent about $300,000.00 in advertising and also that we have used about thirty radio stations. The cost to bradcast over these radio stations depends upon how much time you use. I haven't the slightest idea what the particular announcement that we used in this case cost. K.D.K.A. in Pittsburgh is one of several
120 large broadcasting stations in the country, and the cost of broadcasting over that station is a pretty heavy item. I don't know how much we paid K.D.K.A. for advertising Aladdin Jars because we tie up several
107 articles in the same broadcast, Kerosene Mantle Lamp, Aladdin Electrical Lamp, Aladdin Vacuum Bottles.

The item of $300,000.00 is distributable to the item of advertising our Aladdin jugs as nearly as it is possible to distribute it. $309,00.00 was the figure. To divide the proportion of that amount that went to the advertising of our jugs as against the other items in all the magazines is easy, but about the radio is very difficult. The broadcasting was directed to all of our products, on about
108 thirty stations. This broadcasting was done over a period of the last five years. We did not use all thirty stations at one time. We might be using eighty at one time and might be using a half dozen at another time. I don't know what the fact is as to whether we used eight or six, or whatever the number was, at one time. I just told you we used eighty sometimes and six at other times.

I am in charge of the advertising account. Am director of advertising. It all comes under my control. I can't tell, except in that way, what proportion of that amount went to this advertising. The accounting department
109 could tell what proportion we distributed. Mr. A. C.
121 Thomson, the chief accountant, no doubt could give us that information. The amount per year we spend in advertising, varies. I can't give you some approxi-

mation of the amount if you are going to use that as an average. We might pay anywhere from ten thousand to a hundred thousand.

I will have to refer to my notes to see how much we spent in the 1932 for advertising these jugs. The notes are a memorandum I made of the record I keep in my
110 own department from year to year. I cannot carry in my mind what we spent each year for twenty years. The data I have before me was taken from the records which I myself keep. Approximately for the year 1932, $4300.00; for 1933 so far, $1100.00. I understand you are talking about jugs; for 1931, about $300.00; 1930, $1900.00; 1929, $5400.00; 1928, $2200.00; 1927, $36,000. 1926, $44,000.00. I am giving the round figures. For 1925, $52,000.00; 1924, $78,800.00; 1923, $40,500.00; 1922, $18,000.00.

111 We began to sell these jugs in 1920. For 1921, $12,000.00; for 1920, $11,000.00. Prior to that time we had not sold any jugs. 1919, that was about the time we started. So from 1920 to 1933, these amounts approximately indicate the expenditures that I made for advertising these jugs.

In the accounting department, I think, is segregated the proportion of these respective amounts for these years that went to the radio advertising. As far as my record is concerned, I keep it as an advertising expenditure. I do not break it down.

The form of advertising comprehended by the
122 items I have just given, I have referred to in my previous testimony; magazines, newspapers, trade
112 papers, and lastly radio.

The Mantle Lamp Company is manufacturing jugs today, such as have just been introduced in evidence, or identified.

(Plaintiff's Exhibits 12 and 13, marked for identification.)

There has been no period during which the manufacture of these jugs was stopped; only seasonal, between seasons we may stop production, but not from year to year. There has been continuous manufacture seasonably.

Some of the other stations besides K.D.K.A. are W.L.W. Cincinnati; W.L.S. Chicago; W.H.O. Chicago; K.M.O.X. St. Louis; W.T.C.O. Minneapolis; K.F.M.X. Shenandoah, Iowa; K.M.B.C. Kansas City. If I would

think a little bit, I could probably give you fifty more
113 we have used. We have used as high as eighty, but at no one time. We have used as high as eighty stations at different times advertising these jugs. We have got the entire group, practically, of the radio broadcasting stations for this purpose. The number of people reached by this advertising I guess would be a hundred million. You may be reaching a hundred million with each broad-
114 cast and you can multiply that by the number of broadcasts. Altogether we run broadcasts from about the
123 first of October until the first of February; it varies; some stations we used only one broadcast a week; others we use every day of the week; some use straight announcements, and the others we use fifteen minutes, sometimes half an hour. There is no standard. I can't tell you specifically without itemizing each station, what we use. You would repeat it, you would reach them over again on each broadcast.

Redirect Examination by Mr. Millar.

The total amount I stated had been used for advertis-
115 ing purposes, during that period, is specifically for advertising Aladdin Jars. The amount expended by The Mantle Lamp Company for advertising all of its products, including jars, is very much larger than the figures I mentioned.

The items featured in those broadcasting programs are Aladdin Kerosene Mantle Lamps primarily, then at the close of the program, we announce to the listeners they can obtain this product at local Aladdin dealers, and along with that we mention there are also available Aladdin Electric Lamps, Lamp Shades, Aladdin Jugs and Jars, and Aladdin Vacuum Bottles.

124 The Mantle Lamp Company of America, with reference to the charges made for broadcasting programs allocated to the account for Aladdin Thermalware Jars, make their distribution on the books according to the way we in the advertising department direct them. When the invoice is received from the radio station, we
116 determine what proportion of it might have been devoted to the advertising of each different product; if it is only a sentence or two, announcing one of our products, it is divided proportionately; it may be only a few dollars as

charged against that product. We split the invoice up and pass it through okay to the accounting department for their distribution.

Recross Examination by Mr. Cromwell.

This expenditure of $300,000.00 was devoted to just Aladdin Jugs alone. Whatever was used for advertising the other products such as Kerosene Lamps and so forth, was in excess of the $300,000.00 and this $300,000.00 was expended over the period from 1920 to 1933.

117 125 VICTOR S. JOHNSON, called as a witness on behalf of plaintiff, testified as follows:

Direct Examination by Mr. Millar.

My name is Victor S. Johnson. I live at 303 South Grove Avenue, Oak Park, Illinois. I am president of The Mantle Lamp Company of America and Aladdin Industries, Inc. I have been president of the Mantle Lamp
118 Company of America since the incorporation of the company in 1908. My duties as President of The Mantle Lamp Company of America include the supervision of the patent department of The Mantle Lamp Company.

I have invented devices myself and applications for patent have been issued on a number of them.

The Mantle Lamp Company of America has patent applications pending at the present time in excess of one hundred.

119 No application is filed and no amendment is inserted unless it has my approval. I am familiar with heat insulated receptacles of the non-vacuum type as exemplified by the Blair patent. I am familiar with the art pertaining to heat insulated receptacles. I have been engaged in the manufacture of heat-insulated receptacles, as president of my company, since 1918.

126 I knew Lewis Van Deventer Blair. He is now dead.

I first met Mr. Blair in 1917 in Cincinnati, Ohio. I had been asked by Mr. Clauve, who was associated with the Lippincott Glass Company, who maintained their general offices in Cincinnati, to come down and look over a heat insulated receptacle. I went to Cincinnati. There
120 I met Lewis Van Deventer Blair. W. W. Simonson and

Charles E. Bultman, associated with the Keep Longer Company, who were developing a heat insulated receptacle.

At that time there were a great many heat insulated receptacles there, vacuum bottles, and one embodying the features shown in the Blair patent. The heat insulated receptacle of the non-vacuum type, which I will now describe, had an inner frangible vitreous container terminated in a neck with an opening which was perhaps about three inches in width. It had a metal jacket spaced away from the vitreous container, and between the jacket and the vitreous container there was an insulation of finely divided cork. Between the necks of the jacket and the container, there was a bond of lac, shellac. The container had a stopper and I believe it had a cup cap over the stopper.

121 I had business relations with Mr. Blair after he went to work for The Mantle Lamp Company, but not while he was in Cincinnati. He went to work for The Mantle Lamp Company in January of 1918. He was an ex-
127 pert on heat-insulated receptacles. Mr. Blair was an engineer, and he designed heat insulated receptacles.

I don't believe I could answer accurately as to how many jars have been made and sold by The Mantle Lamp Company of the non-vacuum type, because during the last several years I have not kept track of it, but I recall that when we had some of these other cases, the figures were checked up and at that time I think it was somewhere near a million jars.

The Plaintiff Company did have business relations with the defendant the Aluminum Products Company. When we first started to make jars for the commercial market, the Aluminum Products Company made some of the alu-
122 minum shells for us that we used in the jackets and the cups, that were used in the heat-insulated receptacles.

There is more than one kind of bond. There are bonds of all kinds. I am familiar with interlocking bonds.

In the patent in suit, 14 in that drawing forms a bond both adherently and mechanically. Mechanically the upper section of the metal jacket is screw-threaded, which forms an irregular surface, and it also has an in-turned lip, so that the container cannot move upwards. The glass container has an upwardly tapered portion at
128 its neck. Therefore, the bond is wedged in between the glass and screw-threaded section of the jacket.

I am familiar with the internal construction of Plaintiff's Exhibit 13 for identification. I am familiar with the
123 construction of the outside of the neck of the container. The inner-vitreous container has a groove on its outer surface. The outer metal jacket has a screw-threaded collar and between this collar and the neck of the container there is a bond which has been heated in situ and consequently flows into the screw-threaded section of the collar and the groove on the outer surface of the vitreous container at the neck. It form a mechanical bond, by interlocking. It serves another function. It also forms a seal, so that moisture cannot get into the space between the neck of the container and the colllar of the jacket.

The in-turned flange is very helpful in the manufacture, in that it stops the container and also prevents the bonding material from seeping out. It also is helpful in that it helps to prevent moisture from getting into the space between the container and the collar at the neck.

124 In this construction the jacket has three parts, a collar, and an upper and lower section of the body of the jacket.

129 There is between the walls of the container and the jacket comminuted material like finely divided cork. That finely divided cork insulates against heat and shock. The finely divided cork prevents currents of air to be set up in the space between the container and the jacket. If the finely divided cork were not in there, there would be air currents set up within the space because of the difference in temperature between the container and the jacket. Those air currents with reference to the dissipation of
125 heat, would carry the heat from the outer wall of the vitreous container to the inner wall of the metal jacket and the metal being a very good conductor of heat would dissipate it very quickly. That characteristic is not limited only to finely divided cork. It has to do with any finely divided non-conducting material. Another material which might be used to serve the same purpose there is sawdust.

I have seen the jar, Plaintiff's Exhibit 6, before. I couldn't say how many months ago it was when I first saw it. I believe the first time I saw this jug it hadn't been cut open. It is not in the same condition as when I first saw it, the cup cap, drinking cup, is missing. The cup cap that was on the jar when I first saw it, was a regular

126 cup cap such as is used on these non-vacuum type
130 jugs with a screw thread for engaging the threads on the collar. The cup cap that is on the Reporter's table is similar to the one that was originally on that jar, which was attached to Plaintiff's Exhibit 13 for identification.

The stopper of Plaintiff's Exhibit 6 is made of aluminum. It serves to close the opening in the container and it has some function with respect to heat resistance. It does not fit tightly within the neck of the container.

The plaintiff company still owns the Blair patent, in suit. It acquired the Blair patent by a written assignment from Lewis Van Deventer Blair.

127 The advantage of devices similar to any of these that have been identified here is, they are heat insulated receptacles that will keep food or liquids hot or cold for outings. They will keep coffee or foods hot for probably eight hours and cold for a longer period.

These type of receptacles have advantages over vacuum bottles. They are strong, sturdy and cheaper. They are gallon size and the opening is large enough so that it is easy to get in to clean them. Ordinary pint vacuum bottle has a small opening, is very frail, and the vacuum
131 bottles of the past are not very sanitary. I have seen a vacuum bottle in which you could put your hand. I guess they called it the jar type. It is a straight-sided
128 affair. The usual vacuum bottles have a small neck.

These vacuum bottles are the gallon size. It is only recently that there has been a few of the larger type vacuum bottles on the market. They are very expensive and not really practical commercially.

These jugs of the Blair type when properly made will keep things hot for at least eight hours, a good deal depends on what the outside temperature is, and will keep things cold for a longer period of time.

The largest jar of heat-insulated receptacles of the non-vacuum type that I have seen, I believe, is we made one once of fifteen gallons, but we never made it commercially. We made five gallons commercially.

I have made experiments to determine the weight of the type of jar made by the Mantle Lamp Company of
132 America. The complete receptacle weighs in the
129 neighborhood of ten to eleven pounds. The weight of a gallon of water is around eight and a half pounds. The

weight of one of these receptacles when filled with water is about twenty pounds. These receptacles are very sturdy. They will stand a great deal of abuse in actual use. They use them for every conceivable purpose for outside use. I have seen them used on the drilling rigs at oil wells where they are put to very severe usage. They are used in the field by the farmer, and he isn't any more careful about them than he would be of a metal bucket.

(Two jars offered in evidence, which have been identified as PLAINTIFF'S EXHIBITS 12 and 13, received in evidence marked PLAINTIFF'S EXHIBITS 12 and 13, respectively).

Adjournment to October 25, 1933.

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132 The first heat insulated receptacles were sold commercially by the Mantle Lamp Company the early part of 1919 under the name Aladdin Thermalware.

Aladdin Thermalware jars were first sold in very great quantities because theer was no one-gallon heat insulated receptacle on the market at that time. In 1920, when the jars were sold under the name of our subsidiary, Aladdin Industries that was organized in October 1919, we hired a salesman in the east by the name of Jones and the first two or three days business he secured in Boston, even
133 before he had been to Chicago to make this final arrangement with us, amounted to close of $10,000.00.

The prices at which the first Aladdin Thermalware jars were sold commercially, were $12.50 retail and the prices
133 at which they are now sold are two and a half retail. The retail prices charged for other heat insulated receptacles of similar type are sold in the chain stores from seventy-nine cents up.

Q. And to what do you attribute the difference in these prices?

Mr. Cromwell: I object.

The Court: I don't know whether it is material or not. I think I will let him answer.

The Witness: Will you read the question?

(Question read by the reporter).

A. The ruthless competition that has been going on since the Blair patent was held invalid by the Court in

the Seventh Circuit, and the fact that most of the merchandise has been sold at cost or less than cost.

Mr. Cromwell: I move to strike the answer as a pure conclusion, your Honor, without any foundation at all, a ruthless competition.

Mr. Millar: The word ruthless is a conclusion, probably, but I think the answer should stand.

The Court: Let it stand. Ruthless isn't going to move me very much and I don't think it will move any Court above me very much.

134 Mr. Cromwell: That is satisfactory to me.

The first effective advertising of Aladdin Thermal-
134 ware jars, when they were marketed by the Mantle Lamp Company of America, was in the early part of 1919. Mrs. Odell, Mrs. Rufus C. Dawes, Mrs. Kingsley of Evanston, Illinois, were buying Aladdin Thermalware dishes and Aladdin thermalware insulated containers for these dishes and had set up a community kitchen in Evanston. The idea spread to other sections of the country and these women were asked to give their experience in this community kitchen work. They traveled all
135 over the country and advertised the Aladdin thermalware dishes and containers. They always had with them one of our Aladdin thermalware jars, one-gallon size, and displayed these jars and explained what they used them for. At that time they were used for delivering hot coffee. This advertising was before women's clubs. I remember of one occasion in 1919 Mrs. Odell was asked to go down to the Chautauqua Assembly at Chautauqua, New York and she made an address there on this subject. I positively know that of my own knowledge.

135 With reference to the Keeplonger Company in Cincinnati, the Mantle Lamp Company acquired Blair's invention by royalty arrangement, whereby we agreed and did pay royalties on all the jars we manufactured. We have acquired all of the outstanding stock and rights of the Keeplonger Company since that time. I think the final arrangements were completed here a matter of six months or so ago. The royalty arrangement was made with the Keeplonger Company in December, 1917.

Cross-Examination by Mr. Cromwell.

136 There have been approximately one million of these jugs of the Mantle Lamp Company sold up to the
136 time that the testimony was taken in the case of either the Monarch Company or the Macomb Company. I don't recall just the year, I imagine it was somewhere in the neighborhood of 1924. I have no idea as to how many have been sold since that time. I haven't checked it up. I know that our business in the last three or four years has been very small on jugs, because the prices that they were offered at to the jobbers that we formerly dealt with and deal with now, were such that we could not meet them because the prices were below the cost of material. We are selling some jugs today, but not in any great quantity. That reduction in distribution took place since the prices have been reduced to the point where we can't make them and come out even or make a profit. I attribute the reduction in our volume of sales
137 to the competition that we had. The concerns competing with us are the Monarch Company, Aluminum Products, Hemp & Company, Royal Manufacturing Company, and there are several others that are assembling that we don't know even who they are; in other words, jobbers make arrangements for the assembly of these jubs with whoever will take the business.

For infringement of the Blair patent, other than the Aluminum Products Company, we have proceeded against the Royal Manufacturing Company. That suit has
137 been pending in the Sixth Circuit for sometime. Then there is the Cutino Company in Kansas City. The Cutino suit is the one in which we were restrained by the District Court in this Circuit from prosecuting. Our company is under injunction today to restrain that prosecution. The Royal suit was instituted in the Sixth Circuit
138 a year or two ago. We have made any effort to bring that case to trial. The attorneys have that in hand and it will be heard sometime in the near future. Those were the only suits outside of the suits that were decided in this Circuit. The suit that was brought in Webster City against the Monarch Company back in 1924 was dismissed on advice of counsel for the reason that after we had brought suit in Iowa the Monarch Company came to Chicago and brought suit against us for unfair competition

and we filed a cross bill and Mr. Rector, who was handling our patent matter at that time, advised that we were right here at home and the easy way to handle the matter was to dispose of that case out there and try it right here in our own district.

138 I referred to our advertising program and campaign in my direct examination. The Aladdin Industries, Incorporated, which was the subsidiary that we formed in October 1919, started our newspaper advertising campaign sometime in 1920, the early part of that
139 year, along in the late spring or early summer. These campaigns on the jugs in the early days usually started along in April or May and continued possibly up until August. There hasn't been a year but what we have done some advertising. These recent years, since the business fell off, we have not advertised extensively in newspapers and publications, but we have tied in the jars with our Aladdin Mantle Lamp and Vacuum Bottle program on the radio. In recent years the bulk of our advertising appropriation has been spent in radio advertising.

I was in court yesterday when Mr. Presba testified as to the advertising campaign. I heard his testimony and the views expressed at that time and the facts recited by Mr. Presba are correct, to the best of my knowledge.

Our company had some business relations with the defendant, Aluminum Products Company. We bought
140 aluminum shells from them. I believe we bought shells from several concerns and I am not sure which—I am not sure whether the shells from the Aluminum Products Company were bought in 1919 or in 1920. We bought from two different concerns and some of the shells
139 were from the Aluminum Products Company. We never had any other relations with the Aluminum Products Company since then in the purchase of these shells. We might have bought some aluminum, but I don't know, I couldn't say as to that. We made our own shells after that.

140 Referring to Plaintiff's Exhibit No. 1, being a copy of the patent in suit, it shows here in the drawing that the top of the inner container is tapered outwardly and that is the way that all of the glass parts are made, so
141 that the stopper can be inserted there conveniently. The

outer surface of the container, the neck of the container, is tapered outwardly.

As to whether there is any descriptive foundation in the specification of that patent for that, I haven't looked for it. There is nothing in the specification, but it is inherent as it is shown in the drawing.

Mr. Cromwell: I move to strike out the conclusion as to the inherency of it.

The Court: Q. What is it that is inherent?

A. It is shown in the drawing, your Honor, how it should be tapered.

Q. Which?

A. This neck of this glass receptacle. It tapers outwardly as shown in the drawing. It is not straight up and down.

The Court: What is your motion.

Mr. Cromwell: I move to strike out the part of the answer where he draws the conclusion as to the inherency of it.

The Court: Strike it out.

142 I don't believe there is anything in the specification that the inturned flange is very helpful in the manu-
141 facture in that it stops the container and also prevents the bonding material from seeping out. I don't know that it is in the specification that this inturned flange part was also helpful in that it helped to prevent moisture from getting into the space between the container and the collar at the neck.

143 The Mantle Lamp Company in its commercial embodiment of the patented construction of Blair relies more upon the bond than we do on the lip, but the lip is helpful in the assembly and it will to a degree prevent moisture from finding ready entrance to the space. The Mantle Lamp Company relies upon that flange, mostly, in assembling, but it does help to exclude moisture.

With reference to the form of the bond and the substance of the bond that it forms a mechanical bond
144 142 by interlocking, made with reference to the structure disclosed in the Blair patent in suit or in the commercial embodiment of the jug as made by the Mantle Lamp Company, you will find my testimony yesterday was to the effect it was both an adherent bond and a mechanical bond due to the interlocking. The mechanical bond is due to the interlocking. On the patent in suit the con-

struction is such that the bond in there is both an interlocking bond and an adherent bond. The shellac adheres very firmly to the outside of the neck of the glass container and to the screw threads of the collar of the outer jacket.

There is no necessity for any grooves in the neck of the container, as disclosed in the patent in suit; they are not there because of the taper. In establishing a bond we rely
145 in this case upon both adherency and upon the mechanical interlocking. If we rely solely on the mechanical bond and we use a bonding material that it not highly adherent, then we depend upon interlocking.

The exact character of the bonding material we employed in the commercial jugs we have made in recent years, there has been an organic mixture of resins. Competition became so keen we had to abandon the re-
143 fined shellac seal that was used; we used a cheaper seal and bond. With reference to the resinous substance employed for the bond that I spoke about, we are not using the same resinous substance, that is, in the last lots of jugs we made. The early shellac substance which is referred to in this specification back to another patent,
146 we are not using because it is more expensive and in this patent here there is no reference made to a requirement of any specific bond, it just simply refers to the other patent that he preferred to use that bond. We are using the bond described in the Simonson and Blair patent.

A bond is anything that ties two things together while the material that may be employed for the bond may be many different things. The material we are employing today is not the material that is described in United States Letters patent 1,309,967. Sometimes we use one composition and sometimes we use another. We don't limit ourselves to any specific composition of raw material. The fact of the matter is at the present time I am not absolutely certain as to what material they are using. I know they are using an organic substance of some kind. We buy it first from one concern and then another. I
147 couldn't tell you just what the nature of that sub-
144 stance is. It may or may not be shellac. The jug business is a highly competitive business and we use any kind of material in there that will make a satisfactory and suitable bond. We have used something else than shellac. I don't believe we have used sulphur, I

mean commercially. We have experimented with various things. We may have used Portland cement and sulphur combined experimentally, but not commercially. Commercially we have always confined ourselves to a gummy or a resinous bonding material, preferably. I couldn't answer as to whether or not we have confined ourselves to that, because we have used various materials. We buy these materials from outsiders. We don't always know what is in them. I think we prefer resinous materials,
148 because they are easier to handle. We prefer, of course, to use a bond that is waterproof so it will make a good seal also.

We assume that some of those materials might or might not have had waterproof characteristics. I think the bonds we use, most all of them, in fact, all we have used have had that characteristic. They have always been waterproof because we wouldn't make a really good jug without we had a material that would exclude the water. So far as I know the material we have bought has always been a waterproof material for our bonding purposes.

We aim to use a low conductive bond and a waterproof
149 bond so that moisture cannot seep into the space be-
145 tween the jacket and the container, so that at the same time the bond will form a resistance to the passage of heat. There are several factors in our jug that give the greatest degree of efficiency as a heat insulator. There is no one that does the whole thing. We have one path of heat conductivity up through the neck. We suspend our container at the neck, that is, it is hung from the neck. Then we put a bond in between there that supports it in such a way that it will not readily break off the neck, that is partly due to the fact that we pack the insulating material into the jug in such a way that the thing does not have a chance to swing when the jug is filled with food or liquid, and this heat insulating material in there is packed tight enough so that convective air current cannot be set up, and then we maintain a seal betwene the container, the neck of the container and the neck of the outer jacket so moisture won't come into the space and foul the insulation.

150 As to whether we attach as much importance to the sealing characteristics of the bond as we do to its heat insulating characteristics, we desire both because I have

already explained if moisture seeps in between the container and the jacket it will ruin the insulation. Anything that will lower the insulating value of that container is what we are trying to avoid.

146 The type of vacuum bottle I had seen in which you can put your hand was brought out a year or two ago by the American Thermos Bottle for keeping eskimo pies. It is a very expensive bottle to make and it hasn't come on to the market in a commercial way, because it is too expensive. This bottle is a straight-sided wall affair and has not a contracted neck like the gallon non-vacuum type of jug has. The vacuum bottle of the gallon size is in use today. It is used for eskimo pies in these vending stands at the elevated stations and subway stations in New York.

151 One gallon capacity. Am not sure whether it is as large as one gallon. It would probably be on the short side. In diameter it would be a little smaller, I think, than the size of the earthenware jar that is used in the Aladdin thermalware jug, Plaintiff's Exhibit 13, only it has a straight sided wall, it has no neck. The size to which I have referred is the size of the earthenware container of this jug. I don't know what the size of that jar is in there.

Any vacuum jar is very efficient, more so than a packed

152 jar, that is, efficiency from a thermal standpoint, but not from a shock standpoint.

The construction of the thermos jar to which

147 I have referred, has some sort of a jacket oh it to protect it, because although these containers are not handled, they are right at these stands and they don't have to be carried around and subjected to rough usage like the non-vacuum type jugs receive.

Redirect Examination by Mr. Millar.

In claim 10 of the patent in suit I find there a reference to the inturned flange, with reference to which I have been interrogated.

153 (United States Letters Patent 1,477,101 issued to Pearl H. Brainard, and a printed copy of United States Letters Patent 1,489,059, issued to Pearl H. Brainard, offered and received in evidence marked PLAINTIFF'S EXHIBITS 14 and 15, respectively.)

154 Plaintiff rested.

155 148 NORRIS FAY MURRAY, called as a witness on behalf of defendant, testified as follows:

Direct Examination by Mr. Cromwell.

My name is Norris Fay Murray. I live at 15 North Grant Street, Hinsdale, Illinois. I am sales manager of the Aluminum Products Company of La Grange, the defendant in this case. Have been associated with the Aluminum Products Company approximately twelve years. I was away from the Company in the year 1930.

I am familiar with the products which the Alumiuum
156 Products Company manufactures. Plainsiff's Exhibit 6 is a product of the Aluminum Products Company. Jugs of that particular construction were manufactured by the Aluminum Products Company prior to February '32. When the jug matter first came up we were using sawdust in cleaning our materials at that particular time and we made a certain amount of this type jug and used sawdust which we had already purchased for other purposes. We did not make a large quantity. It was called an experimental jug. We quit using this material the early part of 1932.

In the exhibit before me the character of the filler
157 is sawdust. To the best of my memory be-
149 tween four and five thousand jugs were manufactured by Aluminum Products Company with sawdust as the filler.

We started playing with jugs in '27 and during '27, '28 and '29, we made various models and sold a very small quantity, so that it was in the very early spring of 1930 when we quit using the sawdust. Then as the filler we used Zonolite. Zonolite is not sawdust. We have used Zonolite as the filler continuously ever since that date.

I received the degree of electrical engineer from the University of Illinois and lacked one point of a master
158 in chemistry.

To make an insulator you have to have trapped air, the more finely divided the trapped air, the better the insulator as a general rule. Zonolite is made by roasting a micarda ore or a mica ore, and it contains trapped air in very fine particles and is a very excellent insulator and is used by icebox manufacturers and many other manufac-

turers. The properties of Zonolite with reference to the absorption of moisture, we have found that it is what we call non-absorbing. Water will adhere to it. It will mat up when wet, but it will not absorb water to any great
150 extent. There is no capillary attraction between the fibers.

We have continued to use Zonolite up to this time. Plaintiff's Exhibit 6 does not correctly disclose the filler material which we are now employing for our jugs.

159 Zonolite is really a mineral ash, so called, loose. It will not rot or decay in a moist condition as will sawdust or cork or other materials.

The history of the development of the manufacture and sale of these non-vacuum jugs by Aluminum Products Company is, we are always anxious for a volume of business involving sheet aluminum. That is our business. In 1927 I made a commercial trip down into Indiana, investigated the market possibilities of a jug, and bought a sample jug at that time. I think I bought it in the Owl Drug Company at Indianapolis. I brought it back, presented my story and was turned down. We decided we would not make jugs because of the breakage of the containers at that particular time and we had plenty of other business. I took that jug home and experimented more or less continuously in my spare moments up until I left the Company in 1930. I came back to the Company
151 in 1931, got hot on jugs, did some more experimenting and we finally made the jugs. We made this at one time—I can't say just when because from 1927 until 1930 we made various jugs and tried them out with the
160 trade. We made various types of inner containers.

The nature of the material that we put between the neck of the jacket and the neck of the container, as far as the crock was concerned, I did not use any material with a crock, but we did experiment with aluminum inner containers. We also experimented with vitriolized steel containers, and in those containers we used asphalt products, Gypsum. We may have used some litharge glycerine at the same time. The material we use for this purpose in our present jugs is sulphur. We have used sulphur for that purpose continuously, since we first started, in our commercial jugs. Sulphur is an inorganic substance.

The particular purpose that sulphur body serves be-

tween the neck of the metallic jacket and the neck of the earthenware container, in the completed jugs, is, it forms a rigid connection between the two. It holds the inner crock container firmly in position at the point of contact.

The Aluminum Products Company does not employ
161 that material at that point for any other purpose
152 than that which I have just stated. We have never been interested in any other characteristic of that particular bond.

I would say that twenty percent of the earthenware crocks as they are employed by Aluminum Products Company in their jugs are what we call ovals or egg shaped. They are very uneven. When you make a stack in the pottery the heat comes up the outer edge and strikes only one edge of the jug and it becomes distorted in shape. That caused us to enlarge the shoulder that we now put on the top of the jug to conceal the fact that in some of them, they were oval and there were some of them out of shape. We also found that the neck varied considerarbly
162 in shape and made all different forms. In actual tests we found that the variance was such that sometimes it took a considerable amount of material to hold the crock in its position with respect to the container. We found that sulphur, being very inexpensive, was the material to use for that particular type of jug. At the time we started making jugs we investigated from a cost standpoint two or three other bonds that were recommended, but sulphur was the cheapest at that time that we could find. That was an important factor in adopting sulphur.

163 The device which you hand me is a top removed from one of our jugs that was fractured on a test
153 made to determine the destructibility of the jug.

(Said device marked Defendant's Exhibit 1 for identification.)

The metallic member of that exhibit represents an aluminum shoulder, the top of the metallic container of the jug. The fractured earthenware member represents the liner or inner container.

Sulphur is the material that is interposed between the mouth of that earthenware inner container and the metallic breast or top. That correctly represents the material that we use in our commercial jug, with reference
164 to all the elements of the exhibit before me. As to whether or not I find any movement between the earthen-

ware member of that exhibit and the metallic member of the exhibit, it is fixed, very rigid. Since we first started, we have always used one or two grooves at the neck, and all of our jugs are fastened rigidly at this point through the action of the groove on the crock and the threads in the neck. I have used other materials besides sulphur by way of experimental development for the purpose of uniting the metallic top of the container and the earthenware crocks. I used an asphaltum base material, commercially similar to macadam. Also used U. S. Gypsum products. Then I used a mixture of asphaltum material and zonolite. Sulphur is much cheaper. It is also faster in
165 154 working through the factory. On a production line, you probably have eight moulds for this particular jug. You can remove a jug, we will say, in five minutes, when, if you use U. S. Gypsum, it has to set for thirty minutes; the other products would probably have to set for fifteen minutes. That would mean that on our production line we would have to have a considerable quantity of jugs setting there cooling, and that gums up the production.

The jugs have a cast iron mandrel that has a groove, the shoulder is set into the groove, the jug is placed on the center, and it is centered by part of the mandrel, the jug is rotated to be certain that it sets firmly in the aluminum shoulder. Then a dipperfull of molten sulphur is taken from the report and poured in at the neck. The sulphur is solidified. The length of time after its application to the breast of the jug varies with the temperature of the mould. When you start it, you can do it in two minutes, and as the moulds so set in tend to warm up, I would say, three or four minutes, maybe six. After the setting of the sulphur as just described, it is possible to use the breast and the crock so assembled in finishing the
166 assembly of the complete jug, I would say four minutes, practically instantly. As soon as this is set, it goes immediately across to the next operation.

155 One of the selling points of our jugs is the fact they are hard to break. That exhibit which has just been identified by me, became impaired or broken as it is, by Mr. Hastings, Jr. He was working at the plant, and we told him he could not break it, in a joking manner; he is rather husky and he started in to break it up but he didn't until he finally backed away from a cement wall and threw

it about twenty feet with full force so that it hit on the bottom, or rather on the corner, and fractured the inner container, and creased the stele and he won the argument at that time.

Cross-Examination by Mr. Millar.

167 Zonolite is a granulated substance, yellowish in appearance, not dissimilar to ground cork.

156 JOHN F. AMERINE, called as a witness on behalf of defendant, testified as follows:

Direct Examination by Mr. Cromwell.

My name is John F. Amerine. I reside at 1105 East Adams Street, Macomb, Illinois. I have resided in Ma-
168 comb about thirty-five years. I am employed by Hemp & Company. Hemp & Company manufacture jugs, steel furniture and metal stampings. I mean by "jugs" a jug that has an earthenware container and a steel jacket, with an insulation between. I have been employed by Hemp & Company about two years. Before I entered the employ of Hemp & Company I was employed by Macomb Manufacturing Company in Macomb. Their business is along the same line as Hemp & Company. They manufactured steel furniture and poultry supplies, and this insulated jug. The jugs manufactured by the Macomb Manufacturing Company were known by the name of "Little Brown Jug."

The Macomb Manufacturing Company first commenced
169 to manufacture and sell these jugs I have referred to about 1921. The jug we manufactured at that time was an earthenware container with a groove around the neck, the breast of the jug was inserted into that neck and
157 grooved together; it had a crack left at the top, and was cemented around the top and packed or insulated on the inside with granulated cork.

I am able to read drawings and understand the constructions shown by drawings. I recognize the construction disclosed in the drawing shown me. That is the Little Brown Jug that the Macomb Manufacturing Company first made in the year 1921.

(Drawing marked for identification as defendant's exhibit No. 2.)

In this drawing at the neck of the earthenware container, the two portions represented by red ink indicates where the cement was used.

The Macomb Manufacturing Company continued to manufacture jugs of the construction shown there in the drawing before me about two years, a year and a half or two years.

When I first went in the employ of Macomb Manufacturing Company I hired out to run the foot shears. Foot shears were used for cutting sheet metal to the size of the products they were making. Later I was made foreman of the plant, the latter part of 1921.

158 To the best of my recollection jugs, like that shown in the drawing marked for identification as Defendant's Exhibit No. 2, made and sold by the Macomb Manu-
171 facturing Company, we made about two hundred a day the first year, while we were making them by hand. I would say we worked on them about one hundred or 150 days of the year.

A change was made in the construction of the jug that is illustrated by the drawing before me. We changed the position of the cement around the neck of the earthenware jug because it would not stay in on the outside. In the changed construction we put the cement on the inside of the jug.

I am able to recognize the construction shown by the other drawing shown me. That is the way we changed the cement on the inside of the jacket, instead of the outside.

(Drawing marked for identification as Defendant's Exhibit No. 3.)

172 In the drawing marked for identification as Defendant's Exhibit 3, there appears a change of the cement location, to which I have just referred, indicated by red ink. The reason for that change from the application of the cement on the outside to the application on the inside, the cement was put in there to keep the insulation from sifting out through the crack, it was not real tight.

159 The cement applied on the outside of the top of the
173 jug would crack and fall out. It would get hard and dry, and jar around, and crack and fall out of the groove.

I would say between ten and fifteen thousand jugs were

made that were constructed in accordance with the change or rather with the application of the cement as indicated in both of these drawings. As foreman of the Macomb Manufacturing Company I was in a position to know those facts. That extended over a period of a year and a half.

I am acquainted with Mr. Pearl H. Brainard. I worked for Mr. Brainard previously at the Sheet Metal Works. He and Mr. Sharp went into the business of Sheet Metal Work for manufacturing poultry supplies in Macomb. I worked for him at the Sheet Metal Works before I went
174 with the Macomb people. I have known Mr. Brainard personally for about twenty-five or thirty years. He was president of the Macomb Manufacturing Company, during the time I was with the Macomb Manufacturing Company. I had a lot of personal contact with him when I acted as foreman. Those contacts were brought about in connection with the handling of the business that I did for the Macomb Manufacturing Company, in the
160 course of my employment there. Mr. Brainard knew me and I knew I was employed there.

175 The construction of the jug was changed for a better looking jug, in 1922 I believe. That was the only reason why we changed from the construction of the jug as shown by those drawings. They had been manufactured and sold by the Macomb Manufacturing Company for a year and a half or so and I would say that fifteen thousand or more of those jugs had been made and so sold.

The construction to which we changed was a different
176 shaped body and they also had a screw neck. That change took place in 1922 and the change was made because they wanted a better looking jug; the customers wanted something that looked better.

I designed that jug of 1922. I had no co-operation, only that Mr. Brainard and I drew the pictures. Mr. Brainard told me that we would have to have a better looking jug. He asked me to come into the office with him and draw pictures and compare them, to see if we could draw a picture of a jug that looked better than the one we was already making; we drew three pictures apiece, of a different type of jug. Mr. Brainard made certain pictures of these jugs and I made certain
161 pictures of them also. He called Mr. Sharp from
177 St. Louis to Macomb. Mr. Sharp is the general

manager of the Fred J. Swaine Company of St. Louis. They make dies, and punch presses, accessories. Mr. Sharp was called to Macomb because they had previously made dies for Mr. Brainard. Mr. Sharp came. The result of that visit of Mr. Sharp was, we looked over the drawings, he picked this drawing that represented the Little Brown Jug and proceeded to make the dies for that type of jug.

I recognize the construction shown in the drawing marked for identification Defendant's Exhibit No. 4. That is the construction we changed to from the original Little Brown in 1922.

After we changed over to the construction shown in the drawing marked for identification as Defendant's Exhibit No. 4, we continued to manufacture the jug as shown by Exhibits Nos. 2 and 3. As long as I was there,
178 we made the other jug. I left around in 1923 somewhere.

When I designed the jug shown by the drawing Defendant's Exhibit No. 4, I had nothing at all to guide me in the making of that design. Having in mind the question of jugs of any other manufacturer, or patents, or anything that would disclose any other construction, I had none whatever.

162 Mr. Brainard is here in court and he is the gentleman to whom my testimony has referred.

(Device marked as Defendant's Exhibit No. 1, and three drawings identified as Defendant's Exhibits 2, 3,
179 and 4 offered and received in evidence as DEFENDANT'S EXHIBITS 1, 2, 3 and 4, respectively.)

180 *Cross-Examination by Mr. Millar.*

In the assembly of jars I mean by "Cement", Portland cement and a mixture of plaster of paris. I wouldn't say as to what the proportions were.

I worked under Pearl Brainard in 1921 for the Macomb Manufacturing Company. Mr. Brainard was the only one that was there. I know C. R. Wright. He went to work for the Macomb Manufacturing Company, in the year 1922 sometime.

I don't know who made those drawings. I couldn't
181 say where they came from. I don't know anything about them. I first saw them today. I don't know who put the red ink on there.

Q. And at the time you made the six pictures—or, rather, you made three and Mr. Brainard made three?

A. Yes, sir.

That one right here of the six was adopted by the company, indicating Defendant's Exhibit 4. As to what became of the drawing I made back there in 1924, or whenever it was, I couldn't say as to what became
163 of it. As to how it differed from the drawing you now show me, Defendant's Exhibit 4, it might not have been exactly in principle that, but that is the idea.

Q. It wasn't the same principle?

A. I say, it might not have been in detail.

I think it was in 1922 when I made these drawings.
182 Well, I couldn't say as to the exact time when I started making jugs as shown in Defendant's Exhibit 4. The dies had to be made up before we could make them. I would say it was about in the latter part of, or the first part of '23.

The Macomb Manufacturing Company did make jugs as shown in the patent now handed me, No. 1489059, identified as Plaintiff's Exhibit 15. That is not the first type of jug they made. This jug differs from the jugs they first made, as it has a cap on it. The one shown in the patent has a cap. We did sell jars commercially without a cup. I think it was in '23 when we first started making jugs similar to the one showing a patent with a cup.

Q. This construction then, was made after the one shown in Defendant's Exhibit 4, was it?

A. This jug was made continuously from 1921 until I left the shop. Continuously from 1921 on.

183 164 I think we began making this one in 1923. We still made the one shown in the patent in 1923.

We made jars similar to those shown in Plain-
165 tiff's Exhibit 14. We made jars like that in 1923.

I couldn't say as to when I first saw a jar made by a concern other than the Macomb Manufacturing Company, but it was after we started to make them. I never saw a one-gallon container until after I went to work for Mr. Brainard in '21. I think it was after we started to make that late model jug that I first saw a competitor's jug.

184 166 GEORGE ASBELL, called as a witness on behalf of defendant, testified as follows:

Direct Examination by Mr. Cromwell.

My name is George Asbell. I live in Macomb, Illinois. My present occupation is that of common laborer. I work for Hemp & Company. Have been working for Hemp & Company since '31. Hemp & Company is located at Macomb, Illinois.

Before I went to work for Hemp & Company in 1931 I was employed by the Macomb Manufacturing Company, located in Macomb, Illinois. Their business was making poultry fountains, poultry feeders and insulated jugs. I mean by "jugs" thermo jugs, they call them. At the time I worked for the Macomb Manufacturing Company the jugs made by that concern were known
185 by the name of Little Brown Jug. The Macomb Manufacturing Company is still using the name of Little Brown Jug, but not that particular jug.

I started to work for the Macomb Manufacturing Company in '21. At the time I was employed by them I did just anything. I had nothing to do with the manufacture of these so-called Little Brown Jugs, and I
167 never at any time had anything to do with the manufacture of those Little Brown jugs.

I was acquainted with Mr. Pearl Brainard. He was connected with the Macomb Manufacturing Company at the time I was there.

He remained in association with that company up until about 1928, something like '27 or '28. I don't remember what year he went out of business. He left the employ
186 of the Macomb Manufacturing Company, somewhere in there.

Mr. Brainard knew me. He knew I was employed there in 1921. In the year '21 I expect the Macomb Manufacturing Company ran about fifty employees. When I first went there, they had about seven or eight. Mr. Brainard was president at that time.

I helped assemble these Little Brown Jugs, something
187 like that, or solder them. I helped to assemble them, cut them out, solder them. That is about all I helped with.

The Macomb Manufacturing Company continued to

make those Little Brown Jugs about three years, two years and a half, two years maybe. Of the kind that was made at the time I went there in 1921, approximately between fifteen and twenty thousand were made. In making those jugs they would probably run from 175 to 200 a day.

I know John Amerine. He was employed by the
168 Macomb Manufacturing Company when I was there,
188 as factory foreman. He was boss, that's I know.

Recess until 2:00 P. M.

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189 C. R. WRIGHT, called as a witness on behalf of defendant, testified as follows:

Direct Examination by Mr. Cromwell.

My name is C. R. Wright. I reside in Macomb, Illinois. I am now employed by Hemp & Company in the
190 capacity of General Superintendent. I have been with Hemp & Company in that capacity about three years. Before I went with Hemp & Company I was with the Macomb Manufacturing Company located at Macomb, Illinois. The Macomb Manufacturing Company was engaged in manufacturing sheet metal items, such as chairs, stools and heat insulated containers, hot and cold jugs. Insulated jugs of the non-vacuum type.

I went with the Macomb Manufacturing Company in the early spring of 1922 and continued until they were purchased by Hemp & Company. That was about 1930.

At the time I was first employed by the Macomb
169 Manufacturing Company the kind of jug they were
191 manufacturing, was an earthenware jug with an earthenware liner encased in a metal jacket insulated with granulated cork.

In that particular jug that was manufactured at that time, the provision made for connecting the earthenware container to the metal jacket, was a groove around the earthenware container towards the top or on the neck and the top of the jug was snapped into this groove.

The Macomb Manufacturing Company manufactured during the year 1922, I would say pretty close to fifteen or twenty thousand of those jugs.

That particular construction of jugs was continued to be manufactured by the Macomb Manufacturing Company until the early part of 1924. We manufactured them in production in 1923 and made a few in '24.

192 I understand the construction disclosed in the drawing marked Defendant's Exhibit 2. That is a construction we used during the years of 1922, 1923, the general construction. There were a few changes made later, after that, of the first jugs that were manufactured by the Macomb Manufacturing Company.

170 On further examination of that drawing I find with respect to the relation of the top of the metallic jacket to the earthenware container that the top of the metallic jacket was slipped into the groove as indicated here in the drawing, snapped together over on the side, and the opening that was left in the groove that the metal that did not fill up was closed with cement.

The only difference in this drawing, compared with the actual construction of the jug which was made in 1922 and 1923 by the Macomb Manufacturing Company is—the jug was inverted and this cement was placed on the inside rather than the outside. The change was made in that method of using the cement because this cement slipped out of the groove and allowed the insulation, the cork, to sift out through that hole.

193 Defendant's Exhibit No. 3 shown me is the same as the other drawing with the exception it shows the cement on the inside rather than the outside. The cement on the inside is indicated on the drawing in red.

The only change that structure shown by Defendant's Exhibit 3, compared with the changed structure to which I have just testified as to the application of cement, is that the cement is put on the inside rather than the outside.

171 That structure as shown there compared with the actual structure as it was embodied in the jug, is actually the way it was made.

The nature of the cement that was used in the jug to which I have been testifying was plaster of Paris and Portland cement.

I am acquainted with Mr. Pearl H. Brainard. I think I have known him in the neighborhood of twenty-five

194 years. I was employed by Mr. Brainard and employed by companies that Mr. Brainard was employed by, the American Steel Products Company of Macomb and the

Macomb Manufacturing Company. I was employed at the American Steel Products Company before I was employed at the Macomb Manufacturing Company.

Mr. Brainard was the president of the Macomb Manufacturing Company. He was in charge of and spent most of his time on the road selling. He continued with the Macomb Manufacturing Company, I can't be exact, I think it was 1925, 1926—

During my employment at the Macomb Manufacturing Company they changed over from the construction
195 of jug shown in the exhibit, drawings, 2 and 3; we changed to a different type of jug. I mean that the actual construction of the jugs was changed to incorporate
a threaded collar so that it would hold a cup. Other-
172 wise the jug was constructed practically the same as this. The fundamental principles of the jug were the same now as they were then. They have never been changed. In 1922 the change was made and the jugs went into production in early 1923.

I am able to identify Defendant's Exhibit 4. That is the construction of the jugs that was brought out in 1922, 1923. That si the construction of the jug as it is today.

Mr. Amerine designed this jug shown by Defendant's
196 Exhibit 4. Mr. Amerine was the factory superintendent of the Macomb Manufacturing Company when I went to work there.

The first jugs we made were just as efficient as the jugs we are making today. Customer demand for a better looking product was the reason for changing over from the construction of the jug shown in Defendant's Exhibits 2 and 3 to that shown in Defendant's Exhibit 4.

A change was made in the cement that was used for holding the earthenware container to the metal of the enclosing jacket or casing. We changed from plaster of paris and Portland cement to sulphur. We got more rigidity out of the sulphur and we increased production. You don't have to wait for it to get hard. You have to
197 wait for the cement to set and the sulphur cools
173 as quick as you pour it in. You pour it in hot and it cools immediately.

Mr. Brainard is in the court room today. He is sitting in the end chair over in the jury box.

Cross-Examination by Mr. Millar.

I testified in the case of The Mantle Lamp Company of America *vs.* The Macomb Manufacturing Company; that case was tried in the Federal Court at Springfield about January, 1926, to the best of my recollection. I heard Albert Bailey testify at that time. I believe he was President of the Company at that time. He was one of the officers of the company. I was present in the
198 court the day he testified. I think I heard his testimony.

I do not remember that he testified that the reason the jars with the slotted necks were discontinued was because they were rather a crude affair. After I began to work for the Macomb Manufacturing Company, the Macomb Manufacturing Company continued the use of cement around the neck of the jacket or the jar I would say, three maybe four years, something like that. The purpose of having the cement in that mixture was to make it hard.

I remember testifying before Judge FitzHenry, but what the date was I don't remember. I recall
174 I was interrogated by you at that time. I think I was also questioned by Mr. Levering.

199 Mr. Cromwell: I don't see the pertinency of this your Honor, this cross examination.

The Court: Overruled.

Mr. Millar: I am testing the credibility of the witness. He said they used something for four or five years.

Mr. Cromwell: Go ahead.

Mr. Millar: Q. Were you asked these questions:

"Q. When did you stop using cement mixed with plaster of paris for the material disposed between the neck of the container and the neck of the outer jacket?

"A. Stop using the cement?

"Q. Didn't you state on direct examination that you first used plaster of paris and cement, and later on you eliminated the cement and used only plaster of paris?

"A. Yes, sir.

"Q. When did you stop using cement?

"A. Let's see. I started there on May 7th and I worked possibly six months and found out that that cement done absolutely no good and we quit using it. That is my nearest recollection on that."

200 A. I don't remember, but that is possibly correct because we did stop the cement because it was worthless.

175 *Redirect Examination by Mr. Cromwell.*

The fact is, as to the application of the cement on the outside and on the inside of the top of the can or casing of the early jug, originally the cement was placed around the outside of the container as shown in the drawing. There was a very thin coating of it around there and it wouldn't hold. The neck of the stoneware is never round. It is very rarely you find a round neck. They can't burn it and get it round, so it left holes there in the top to fill up. We had to fill up those uneven places with cement or some material to plug that hole up. We used plaster of paris and cement to fill that. This left a thin film that easily cracked off; it showed a dirty place in the cement
201 and it didn't look good. The cork and insulating worked out through that hole. It was very unsightly, due to the application of the cement on the outside. Putting it on the inside we could get in a much heavier piece of cement there, had a much better opportunity to stay put, because of the volume we could put in there. The cement used on the outside of the container was discontinued, I think, in 1922. Then it was placed on the inside. I am not exactly sure as to those dates when it was changed, but it was right around that date when it was changed to the inside.

176 FRANK L. SESSIONS, called as a witness on behalf of defendant, testified as follows:

202 *Direct Examination by Mr. Cromwell.*

My name is Frank L. Sessions. I live in Lakewood, Ohio, a suburb of Cleveland. I am a consulting engineer with offices in the Rockefeller Building, Cleveland.

I am a mechanical and electrical engineer, holding the degree of mechanical engineer granted by the Worcester Polytechnic Institute of Worcester, Massachusetts. I have served as engineer in various capacities since my graduation from the Tech in 1889. Among the companies whom I served were the Deane Pump Company of Holyoke, Massachusetts, Fort Wayne Electric Company at Fort Wayne, Indiana, Brown Hoisting and Conveying Machine Company at Cleveland, Ohio, Jeffery Manufac-

facturing Company at Columbus, Ohio, Standard Welding Company at Cleveland, Ohio. For these companies I did both mechanical and electrical engineering, designing, testing, manufacturing and installing both electric and mechanical machinery, and installation of manufacturing
203 processes. I have been obliged to analyze and compare mechanical structures and processes all during my experience.

I severed my connection with the Standard Welding Company in 1913 and have since been in independent consulting engineering work designing machinery, testing, making investigations and reports. In my work I
177 have been frequently called upon to act as mechanical and electrical expert in litigations, particularly patent litigations. I appeared as expert witness for the Monarch Manufacturing Company in the case of the Monarch Manufacturing Company against the Mantle Lamp Company and the counterclaim, Mantle Lamp Company vs. Monarch, that has been frequently mentioned here today.

I am familiar with the Blair patent in suit, No.
204 1,435,199. The Blair patent is entitled "Heat Insulated Receptacle." This article comprises an inner receptacle or container for holding the desired material to be kept hot or cold; this inner container is secured in a metal outer container or jacket. The inner container is made of glass or some other vitreous substance. There is a space between the inner container and the jacket which is filled with a heat insulating material such as cork, ground cork. The specification on page 2, line 27, refers to this material as "a comminuted substance 31, of poor heat conducting properties, such as cork, and this substance is packed with sufficient density to prevent violent pendulous movements of the container occasioned by shocks administered from without the receptacle, while permitting the expansion and contraction and the slight bodily movements of the container which are produced by changes of temperature."

The jug, as the entire article is named, is contracted at the top and provided with an opening smaller
178 than the diameter of the inner container; there is a stopper provided for closing this opening and a screw cap for retaining the stopper in place. The inner container is a single wall botttle as disinguished from the double wall containers of the vacuum type, which were

205 known and had been in use a long time at the date of the application of this Blair patent, which was October 29, 1919. The outer jacket is made in two parts, which are connected together by spinning over the bead at the point marked 9 in the drawing. The neck of the inner container or bottle is positioned in the neck of the jacket and sealed there by means of sealing material or bond 14. This bond is seen at the right of the section of the neck of the inner container between the threaded portion of the jacket and the neck of the inner container. It extends up over the top edge of the inner container at 13; the shell or jacket has an inwardly projecting flange 6, which rests upon the top of the bonding material 14 on top of the inner container edge. The stopper for this jug is the part marked 17 in the drawing and it is of the vacuum type. It is a glass stopper from which air is exhausted to make it a poor conductor of heat. The top of this stopped is in the form of a spherical shell or button, 25, and the cup which is screwthreaded on to the threaded portion of the jacket at the point 5 is so shaped that
179 it contacts with the top of the stopper at about the point 29, in order to center the stopper in the orifice
206 of the bottle. The stopper is slightly smaller in diameter than the inner diameter of the neck of the bottle and there is a clearance space left at 22, an annular clearance space extending all the way around the stopper so that there is no contact between the stopper and the neck of the bottle. They call the stopper 17, I believe. 19 is a rubber gasket or heat insulating gasket which rests upon the top of the inturned flange 6 of the jacket and is clamped there by a shoulder 18 of the stopper so that any heat that is stored in the stopper can only get to the outer air by passing through either the annular space 22 or the gasket 19 or through the spherical button 23, through the cup 29, or through the air in the space which is marked 27 in the drawing.

The bottom part of the receptacle, the part marked 2 which is a hollow base for the receptacle, is secured to the top part at 7, and the entire space between the jacket and the inner container is filled with ground cork as I have described. Any heat ttha passes out of the con-
180 tainer to the outer air or from the outer air into the container must pass through the jacket, then through the insulting material 31, of ground cork; then through

the vitreous wall of the inner container 11, or must pass through the stopper that I have just described.

207 The purpose of this article is the same as that of thermos bottles, but on account of the single wall of the inner container it is more practical to make a large capacity container of this non-vacuum type than it is of the vacuum type.

The particular features of this Blair device are the single wall container, the jacket, the comminuted or pulverized heat insulating material between them, and the bond which centers the jacket neck around the neck of the inner container. This bond is really a mechanical adaptor. I think all parties here will agree that without doubt some kind of a mechanical adaptor between the glass or earthenware, which cannot be made of uniform size or shape, is absolutely necessary, in order to connect the mechanical threaded end of the jacket to the inner container to receive a threaded cup or any other kind of a tight fitting cup. So, in my opinion, the chief function of this bond is that of a mechanical adaptor to round up the irregular, distorted shape of the container and to secure to it the metal shell which can be made to accurate dimensions for receiving the cup. The pat-

181 ent, however, enlarges upon the function of this bond and particularly upon the function of sealing the insulating material of ground cork or other granular material to prevent moisture entering it, and making a firm

208 connection between the jacket and the vitreous container to suspend the inner container in the jacket. The pendent suspension of the container in the jacket, in my opinion, is chiefly useful in assembling the device and only functions until the granular insulating material is well packed in position, after which, so far as the suspension of the inner container in the jacket is concerned, the bond between the neck of the container and the neck of the jacket could be dispensed with. Of course, the sealing of the space where the comminuted material is placed is very desirable and perhaps necessary.

209 Another function claimed for this bond, and I believe stressed as the most important function, is that of its heat insulating qualities. That, to my mind, is entirely submerged in the value of the bond as an adapter, to fill the irregular space between the jar or inner container and the metal shell, for the reason that this insulating

compound, so far as I can learn, and I believe so far as Mr. Davis understood, as far as its heat resisting qualities are concerned, they are on the order of the heat resisting quality of the inner container itself.

If the inner container could be accurately dimen-
182 sioned and have a screw-thread on it, to receive the jacket, there would be no necessity for any other heat resisting material there, for the reason that the material of the jar itself is as good a heat resistor, if not better, than that of the bond.

I will not read extensively from the specification, but on page 2, commencing with line 27, the construction of the jacket, and the positioning of the insulating cork in it are described, one of the functions of this cork being to prevent breaking the inner container by shocks which might be transmitted to it, except for the cushioning effect of the cork filler. The jacket is made in two parts, to facilitate manufacture.

That is described on page 2, commencing with line 51, of the specifications. Then on page 2, commencing with
210 line 77, the characteristics and functions of the bonding material, which the inventor prefers to use are set forth at length. I would like to read that paragraph, commencing with line 72 of page 2 of the patent in suit, as follows:

"The substance of which the bond is composed is, preferably, a prepared shellac which is fully described in United States Letters Patent #1,309,967, granted to Simonson and Blair on July 15, 1919. This substance is of especial utility as a bond inasmuch as it may be fused in situ at a temperature which is lower than the temperature at which glass fuses and, by sufficient heat treatment at normal pressures, becomes, exceedingly tenacious and permanently adherent to the neck of the jacket and
183 the container. The substance is ground before it is applied, and when heated it fuses and becomes sticky and immediately attaches itself to the adjacent parts. Prolonged heating hardens it, renders it substantially insoluble in alcohol, and materially raises or eliminates its melting point, so that its durability as a bond is ensured. The tenacity of this bond is such that it is capable of supporting the container in its pendent position with the jacket without the aid of adjunctive supporting devices. The filling between the jacket and the container is pri-
211 marily employed as a shock-absorber and insulator, and

for the purpose of preventing the container from responding to external shocks which, if of sufficient intensity, would cause the container to oscillate to such extent, relatively to the jacket, as to fracture its neck. Experiments have shown that the bond will remain intact and adherent to the parts even when contiguous portions of the glass of the container are broken by a shock."

That is, the adherent quality of the bond is stressed very strongly.

In this patent specification, the adherent quality is the only factor that is described for connecting the bond to the jacket and to the wall of the inner container. It has been brought out, however, at this hearing, there are indentations or grooves and ridges in the wall of the jacket which interlock with the bond, or to which the bond adheres, those indentations being due to the screw-threads that are formed by indenting the relatively thin metal of the neck of the jacket.

And further, that the outer wall of the neck of the bottle is flared outwardly, so that the bond is locked against movement upwardly by the outward flaring of the neck of the inner container, and locked against movement
184 longitudinally as of the axis of the jacket by the indentations in the jacket which the bond fills. I be-
212 lieve that's all.

I have examined Plaintiff's Exhibit No. 6 and I understand the construction of it. This exhibit comprises a heat insulated vessel in which there is an inner container made of vitreous earthenware of some sort, an outer jacket of aluminum metal, the space between the inner container and the jacket being filled with sawdust. The top of the jacket is contracted to form a neck adjacent the neck of the inner container, and is threaded to receive a cup cap, which is correspondingly threaded.

Between the outer surface of the neck of the inner container and the inner surface of the threaded portion of the neck of the jacket, there is a filling of sulphur, which is adapted to center the inner container in the jacket, and to form a seal between the jacket and the wall of the inner container. There is a cap which appears to be made entirely of aluminum metal, and carries what appears to be a rubber gasket about 3/16ths of an inch thick, the rubber gasket being adapted to rest upon the top surface of the inturned flange of the jacket above the top of the
213 neck of the inner container.

There is no cup cap with this exhibit, Plaintiff's Exhibit 6, but the cup cap I know to be designed to screw upon the neck of the jacket and press down upon the rubber block or washer at the top of the cover of the receptacle.

185 The filling compound, sulphur, is run into the space between the neck of the inner container and the threaded portion of the neck of the jacket, and solidifies there. There is an annular groove formed in the outer surface of the neck of the inner container, and the sulphur flows into it and flows into the internal grooves of the threaded portion of the neck of the jacket and forms a mechanical interlock between the neck of the jacket and the neck of the inner container.

The sulphur is a heat-resisting material. It is brittle, and will easily crack out if forces are exerted upon it, particularly upon its edges, but when encompassed by metal and the jar as it is here, it is durable.

The heat insulating qualities of the sulphur in this jar are in considerable measure counteracted by the fact that the metal flange of the container rests directly upon the top of the upper edge of the inner container, so any heat that is coming through the inner container is transmitted to the aluminum flange thence to the outer surface of the cap cup and to the rest of the radiating surface of the jacket.

214 I was present in court yesterday and heard the testimony offered in behalf of plaintiff in connection with this particular exhibit.

I have examined the various patents which were set up in the answer of the defendant to the bill of complaint and understand the constructions disclosed in those patents.

186 STIPULATION.

It is hereby stipulated and agreed by and between Counsel for the parties hereto that uncertified printed or photographed copies of U. S. and foreign patents, and printed publications, may be introduced and admitted in evidence subject to correction for error, if any there be, as proof of such patents and printed publications, and that the dates of filing, sealing, delivery or publication as recited therein and the stamped dates of receipt by the

United States Patent Office appearing on copies of foreign patents shall be taken as establishing such dates
215 without further proof, subject to correction for errors.

Now, at the same time, if the Court please, I desire to say that I asked Counsel for Plaintiff as to what particular claims would be relied upon as charged to be infringed by the Defendant, and in reply to that I am advised that of the claims of the Blair patent in suit, Nos. 1, 3 to 14 both inclusive, 17 and 18, and 21 to 24 both inclusive, are the basis of the suit, and constitute the issues between the parties on the question of infringement. I am correct in that, am I—

Mr. Millar: That's right.

Mr. Cromwell: —Mr. Haight?

Mr. Haight: That is already in the record, I
187 think.

Mr. Cromwell: I didn't see where it was.

The Court: Very well.

Mr. Cromwell: Q. Will you please examine reissued patent 13093, dated March 15, 1910, to Reinhold Burger and Albert Aschenbrenner, and state what the construction is which is disclosed in the drawings of this patent?

I will ask that the patent be marked for identification as Defendant's Exhibit No. 5.

The Court: It may be so marked.

(Said document so marked.)

Mr. Haight: Have you a volume of these for the Court, Mr. Counsel?

216 Mr. Cromwell: Yes. It is my purpose to offer these in evidence, your Honor, but here is a complete set. I will see that they are bound for your Honor's convenience.

The Witness: Reissued patent 13093, dated March 15, 1910, to Reinhold Burger and Albert Aschenbrenner, marked for identification as Defendant's Exhibit No. 5, is entitled "Field or Hunting Flask." It is a vacuum type heat insulated bottle, of the Thermos bottle type. There is a double wall glass receptacle, the inner wall being cross-sectioned and positioned just outside of the liquid filling shown in Fig. 3. Then there is a vacuum

space at *o*, and an outer wall outside of the space *o*.

188 There is a metal projecting jacket outside of the outer wall of the inner receptacle, this metal protecting jacket being spaced from the inner receptacle. The parts in which we are particularly interested are the necks of the inner container and the outer jacket, and the space between the inner container and the outer jacket. The top of the bottle, the part marked "*e*", is the filler or bond between the metal jacket and the glass inner container.

189 The specification on page 1, commencing with line 58, describes this as follows:

"Around the neck of the bottle is arranged an annular cushion or protector *e*, and the foot or bottom of the bottle is inclosed in a cup-shaped cushion or protector *f*, of
217 suitable elastic material—such as cotton, wool, asbestos, or the like—or of colophony, shellac, sealing wax or other suitable rigid material."

Here we have a glass inner container, although it is double walled, which is sealed to the outer jacket by any suitable material, resinous or shellac or sealing wax or cotton, wool or asbestos, and the bottom of the inner container is supported in shock-absorbing relation to the outer jacket by the padding of similar material, cotton, wool or asbestos or any other desired material, "*f*". It will be noted that the material "*e*" that surrounds the neck of the bottle, the inner container, at the top is so placed that it is positively locked in position mechanically, by the bead at the top of the bottle and by the body shoulder of the bottle where the bottle flares out from the neck to make the body. So that, except for the fact that this Burger and Aschenbrenner patent shows a double walled container of the vacuum insulated type, it has the mechanical construction in principle and much in fact like the constrution of the Blair patent in suit.

The patent to Burger and Aschenbrenner states on page 1, commencing with line 95:

"We do not restrict our claims to the form of
190 bottle consisting of two glass receptacles *a* and *b*, which is shown in the drawings, but also claim all other forms in which the bottle could be used as a field or hunting flask or the like."

218 Referring to Fig. 3 of this patent that I have been discussing, and to the inturned flange of the casing at the

upper end of its neck, with respect to the upper end of the neck of the bottle itself, on the inner container, and the effect that the inturned flange would have with respect to the inner container and the body of the material which is marked *e*, it would prevent any movement of the bottle, the inner container, upward, or of the material *e*. The inturned flange of the jacket extends over and holds the inner bottle firmly in place.

According to the statement appearing lines 63 to 65, the material *e* may be of different characteristics; the specification states it may be of cotton, wool, asbestos or the like, or of colophony, shellac, sealing-wax or other suitable rigid material. Comparing the cushion of protector *e* of the Burger and Aschenbrenner patent with the so-called bond of the patent in suit, my conclusion as to the similarity or dissimilarity of those two bonds, is that aside from the fact that the patent in suit refers to a specific composition of bond patented in the Simonson & Blair patent 1309967, this material *e* is for the same purpose and undoubtedly could be of the same composi-
219 191 sition as the Simonson & Blair patented bonding material. Its function is the same, and it is located in the same identical place between the neck of the inner container and the neck of the jacket. It suspends the inner bottle in pendent relation to the jacket. It seals
192 the space between the jacket and the bottle. It is a heat insulating compound, and if it has adherent qualities it will bond them together in the manner contemplated in the Blair patent. It is also a mechanical adaptor to center the irregularly formed neck of the bottle in the regularly formed, symmetrically formed neck of the jacket.

Patent 46640 to M. M. Clark, dated March 7, 1865, marked for identification Defendant's Exhibit 5-A, is entitled "Milk Cooler." There is an outer can and an inner can, both of them apparently made of sheet metal, such as tin, and there is pulverized charcoal in the space between them. There is also an insulated can cover which is shown at the top of Fig. 2 and separated in Fig. 1, and assembled in Fig. 4. This article is a heat insulated can,
220 although both the inner and outer receptacles are made of metal.

The inner receptacle is pendently supported from the neck of the outer receptacle, and the insulating, pulver-

ized charcoal fills the space between the inner and the outer receptacle and acts as a shock absorber for any oscillations or pendulous movements of the inner receptacle. As a matter of fact, the oscillations and pendulous movements are extremely small, if not practically absent in any of these structures, and the protection which the outer jacket and the pulverized material between it and the inner jacket afford is purely that of absorbing external shocks, and not for preventing pendulous move-
193 ments of the inner receptacle.

I might say as to this patent that the claim states: "The filling in of milk-cans between the inner and outer covers with pulverized charcoal, as a means of preserving milk, in such a manner as to protect the milk from heat."

Patent No. 184,256 to J. C. Moore, dated November 14, 1876, marked for identification Defendant's Exhibit 5-B, shows a demijohn which is inclosed in a casing "A", the demijohn "B" being of glass or other liquid holding ma-
221 terial, and the space between the glass bottle "B" and the outer receptacle "A" is filled with packing.

The specification on page 1, the fourth line from the bottom of the first column states:

"When neck 'C is fragile, I fill this annular space with packing. The packing used may be sawdust, bran, shavings, or other suitable material. The casting A and A' I make of wood—cap D and cover E of sheet metal or tin."

Over the top of the neck of the bottle, there is a cap D, which is separated by a space from the neck of the bottle and filled with packing material. The packing may be of the same material as that around the body of the bottle, although it is obvious that if a hard bonding material were used, the bottle would be efficiently pendently suspended in the neck of the outer jacket.

While the object of this invention appears to have been to prevent breakage of bottles in shipment or hand-
194 ling, the structure is a heat insulated bottle or demijohn as well as a protective structure.

Patent No. 211092, to E. A. Heath, dated January 7,
222 1879, is for a metal protected bottle. The specifications in the second paragraph of the first column of the first page says:

"This invention relates to that class of bottles which are provided with an exterior casing, a suitable packing

being interposed between the two, the object sought for being the prevention of breakages during transportation."

While that is the stated object, the article is a heat insulated jug or bottle. The outer casing, A, is of metal formed in any of the usual mechanical processes of manipulating sheet metal. The inner receptacle D is a bottle. The specification states in the next to the last paragraph of the first page:

"D represents the bottle, which is inserted into the case A from its opened base, the apex or mouth of the bottle passing out of the open top of the neck of the case. The metal at the top of the neck B, above the screw-thread, is then pressed inwardly, so as to close firmly around the neck of the bottle, which may be flanged, as shown. Various methods of closing in the metal of the neck B will readily suggest themselves to the skilled artisan, and I therefore do not limit myself to any specific device."

Then, of the packing, the specification continues from the above quotation:

223 195 "The casing A is made of such size that after the bottle is inserted therein a space is left on all sides between the two, which space is then filled with any suitable soft packing or filling. Various substances may be used, although I prefer to use fine cork chips. This filling covers the bottle completely, including the neck, also the bottom thereof. The metal bottom G is then inserted, pressed down upon the packing and secured in place by soldering, which completes the package."

The bottle D is obviously pendently supported in the casing "A", as the neck of the casing or jacket A is closed in about the shoulder at the top of the neck of the bottle and mechanically held there against displacement. This is a heat insulated bottle, although the patent does not name that as one of its features.

It is to be noted that the outer metal case is a two-part affair. The natural way of assembling the parts being to insert the neck of the bottle into the neck of the jacket, turn them bottom-side upwards, fill the space between the bottle and the jacket, and then insert the bottom G, and secure it there.

(Patent just referred to, marked for identification as Defendant's Exhibit 5-C).

224 One feature which I did not speak of is the cap C which

is threaded onto a threaded portion of the neck B of the jacket. Also another feature, that the inner portion of the top of the cap is rounded and is adapted to press down upon the stopper of the bottle, and there is a washer of what appears to be resilient packing material, and
196 of which it is said on page 1 in the paragraph which is the fourth paragraph from the bottom of column 2:

"This cap may be struck up or drawn from sheet metal and the screw-thread spun thereupon in the manner usually adopted in such cases. A suitable soft lining or packing, *h*, may be inserted into the top of said cap in order to prevent the bottle-stopper from coming in contact with the metal of the cap."

That would serve as a mechanical cushion, and also as a heat insulator.

Cushion *h*, carried by the cap C in its action on the stopper of the bottle compared with the action of the centrally disposed cavity 29 of the cap of the Blair patent with respect to the stopper of the bottle of that patent, functions in precisely the same way.

Adjournment to Oct. 26, 1933.

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26 It is my understanding that the connection of those two parts, the neck B of the jacket A in its relation to the neck of the bottle or inner container D, is what might be called a metal to crock connection. That is, the metal of the jacket B is pressed into contact with the neck of the crock so it is in actual metallic contact without any insulting material between the metal and the crock at the point where the centering action of the metal is effected. There is insulation between the neck B and the neck of the bottle excepting at the point directly underneath the flange of the neck of the bottle, but there is no additional bond or seal provided.

My understanding of the construction of the Heath
197 bottle with reference to the question of the suspensory relation of the inner receptacle to the outer receptacle is, the bottle is pendently supported in the jacket and the space between the bottle and the jacket is filled with ground cork or other heat insulating material to prevent breakage of the bottle. It is very nearly a pendu-

227 lum support before the insulation around the bottle is put into the space between the bottle and the jacket.

If we assume that there may be pendulous movement between the bottle and the container or outer jacket, the construction disclosed in the Heath patent would be capable of such pendulous movement before the filler is placed in the space between the bottle and the jacket, before the cork packing is put in place. There is, however, practically no pendulous movement, as I understand pendulous movement, in any of these devices after the crock or bottle is sealed in position. Pendulous movement must be free to swing and there is no such possibility in any of these heat insulated bottle after the bottles are sealed to the jacket.

Examining Figure 1 of this Heath patent as to any support between the bottom of the bottle or inner container and the bottom of the jacket or the outer casing, there is no support other than the cork packing, which is put
198 in position after the bottle and the jacket have been connected together at their necks, so that it is a perfectly pendulently supported bottle so far as any other support than the cork insulation is concerned.

228 The insulating material of the Heath patent and the insulating material employed in the Blair patent, are of the same composition or nature and disposed in the same place for the same purpose.

There is a multipart jacket or casing in the Heath structure. The cylindrical shell A and the bottom G constitutes the part of that structure in that sense.

My understanding of the procedure that would be followed in assembling the parts of the Heath bottle is, the neck B of the jacket is formed originally with a large enough opening in it to permit the flange of the top of the bottle to pass through it. Hence the bottle is placed in the jacket A from the bottom to the top of the latter, the flange of the bottle sticking out above the top of the jacket. The neck B of the jacket is then pressed into close relation and contact with the neck of the bottle below the flange of the bottle neck. Then the two receptacles, the jacket A and the bottle B are turned bottom side up, the space between them is filled with the heat insulat-
229 ing material such as ground cork or fine corp chips, the specification states, which are pressed down and when the space is filled and the bottom of the bottle covered, the

bottom, G, of the metal shell is put in position,
199 pressed down and soldered in position as shown in figure 1 of the patent.

Looking at the patent in suit, the matter appearing at lines 49 to 65, page 2 of the specification of that patent, I find corresponding relations in the assembly of the parts of the Heath patent to the operation of assembling the parts of the structure of the Blair patent as required in that particular matter to which my attention has been directed. The paragraph referred to, I believe begins at line 51, page 2, and continues to line 71 of the Blair patent in suit, describes the manner of assembling the outer jacket 4 and the inner receptacle 11, and this corresponds almost exactly step for step with the method that I have just outlined for assembling Heath patent structure.

(Patent, just described, marked for identification as Defendant's Ex. 5-C):

230 Patent No. 358,732 to Clisbee, dated March 1, 1887, marked for identification as Defendant's Exhibit 5-D, is for an insulated can. The device consists of two metal cans, A and B, one of which is considerably smaller than the other and is adapted to be placed inside of the other, leaving a space between the two cans which is filled with packing, which the specification states should be preferably a kiln dried sawdust rammed hard and firmly packed. The necks of the containers are securely joined together
200 at the top so that the inner container is pendulently supported from its neck within the outer container, and after the non-conducting filling, C, is in position, the inner container is protected from shocks and jars which the vessel may receive in handling or transportation.

It is noted that the object of this invention stated in the specification, mentioned at line 9 of the first page, is to furnish an improved insulated can for coffee and other beverages, packed in its body and top to resist radiation so that the liquid may retain its heat for twenty-four
231 hours or more. These heat insulated jugs, which are the subject matter of this litigation, are used very frequently for coffee and this Clisbee patent, which was patented in 1887, has for its first stated object to keep coffee hot that may be put into the container. There is a heat insulated stopper, which is fitted into the neck of the can to prevent the escape of heat from that part of the article.

The material which constitutes the heat insulating substance as employed in the Clisbee patent compared with the heat insulating material of the Blair patent in suit, is of the same nature, being pulverized dry fibrous material. The Clisbee patent refers to kiln dried sawdust, whereas the Blair patent in suit refers to comminuted cork.

These substances have been used interchangeably in these heat insulated receptacles; apparently since there is any record of heat insulated vessels in the patent
201 office. I have personally known of their having been used for during all of my life on which I have a
232 memory. I recall the ice house on the farm in New England, where I was born, had a double wall exterior packed with sawdust and the ice was packed in sawdust, and powdered cork or ground cork is referred to in a number of these very early patents which have been cited in this case.

Patent 438,149 to Fox, dated October 14, 1890, marked as Defendant's Exhibit 5-E, is for a carboy for acids and the object of the invention is stated in the specification mentioned at line 26 of the first page, reading as follows:

"The object of my invention is to provide an improved carboy intended to contain powerful acids whereby danger, damage, and loss from breakage and fire may be reduced, if not wholly overcome."

The carboy A is placed in a box or frame B′, with sufficient space between the carboy and the box to permit of mineral wool being packed in it. This mineral wool is shown at C. It extends all around the carboy and underneath its bottom. There is a seal B provided between
233 the neck of the carboy and the hole in the box B′ to hold the carboy firmly in position and to prevent loss of the heat insulated material C. The specification on page 1, line 49, describes the packing C as of "mineral wool or other suitable fireproof material."

Page 1, commencing with line 71, the specification
202 reads: "B is a packing of plaster of paris or other suitable material intended to hold the carboy firmly in place within the box or frame holding it and to exclude moisture or water from the packing C."

Thus we have what is a heat insulated carboy, the heat insulation also furnishing mechanical protection to the carboy against breakage. The carboy is in pendent relation to the box and is held there by the packed mineral

wool when the entire device is assembled, and the neck of the carboy is respectively sealed against leakage of water into the mineral wool or the sifting out of the mineral wool.

The body of plaster of paris B of the Fox patent is a mechanical adaptor or filler to fill the space between the neck of the carboy and the surrounding jacket, yet pre-
234 vents water and dirt from getting into the jacket and prevents the packing of the jacket from sifting out around the neck of the bottle. It is also a heat insulator of low conductivity. Insofar as it is interlocked with the members, that is, with the carboy and the jacket, it is a mechanical interlock or bond in the same way that the insulation 14 of the patent in suit is a mechanical interlock or bond.

235 203 Patent No. 884,582, to Henn, dated April 14, 1908, marked for identification as Defendant's Exhibit 5-F, is for a heat insulated vessel common known as a Thermos bottle. There is a double walled inner container having an inner wall *a* and an outer wall *b*, the space between them having the air exhausted from it to form a vacuum. There is a metallic jacket made in two parts, *e* and *d*, which are joined by a threaded connection to form the outer jacket. There is a space between the outer jacket formed by the parts *e-d* and the glass inner container. The object of the invention is to provide for the removal of the inner receptacle from its metal jacket, and to readily replace the receptacle, should it become broken, with a new one.

About the neck of the inner container there is a bond of plaster of paris which secures a threaded ring to the inner container. This threaded ring threads into a correspondingly threaded portion of the neck of the jacket, so that the inner container or bottle can be unscrewed from the bottom of the jacket and removed. There is a cap *f* which is screw-threaded onto the jacket at its top.

The inner frangible container is pendently supported
236 in the jacket by means of the bond and seal composed of the plaster of paris, reinforced upon its outside by the threaded nipple which screws into the jacket. Between the inner container and the jacket there is
204 placed a centering ring or support near the bottom of the inner container. This part is not given a reference numeral in the drawing.

The only thing lacking from this heat insulated bottle

to make it have all of the features of the Blair patent is the comminuted insulating material between the glass inner container and the jacket. To be sure, the inner container is a double-walled and not single-walled as called for in the Blair patent, but the pendent support of the inner container and its bonding and sealing to the jacket are in the Henn patent.

There is also found in the Henn patent the two-part jacket which permits ready assembling of the inner container in the jacket.

Referring to the Henn patent, as to what the effect of the cap *f* is with respect to holding the stopper *g* in place, the stopper *g* is shown as an ordinary cork, and it is held in position by the cap *f* which is screw-threaded onto the jacket, and in this manner the cap *f* functions to hold a heat insulated stopper in position in the same manner that the cap of the Blair patent holds the special vacuum bodied stopper in place in it.

237 Patent No. 900,075, to Altenberg, dated October 6, 1908, marked for identification as Defendant's Exhibit 5-G, is for a double-walled vessel, that is, it is a
205 heat insulated bottle of the Thermos bottle type, the space between the two walls of the inner container being exhausted of air to form a vacuum. This
206 double-walled frangible inner container is protected by a metal casing 20, which is spaced from the glass container which is held in centered relation to the metal jacket. The glass bottle is pendently supported in the metal jacket by means of a heat insulating bond 21. The specification describes this as follows, commencing with line 100 of the first page of the specification:

"The vessel is adapted to be closed by a suitable stopper 19. A protecting casing 20 surrounds the vessel and is held with relation thereto at its top by a collar 21, which may be plaster of paris for holding the neck of the vessel and the neck 22 of the casing in rigid relation. A packing 23 surrounds the vessel inside the casing and extends longitudinally of the same. I prefer this packing to be of corrugated strawboard. The bottom of the vessel is preferably supported by a felt pad
238 24. A releasable cup 25 takes about the neck 22 and is releasably secured thereto in suitable manner as by having screw connection 26 therewith."

Here, then, we have all of the features of the Blair patented article with the exception that the frangible

inner vessel is a double-walled instead of a single-walled bottle.

I would like to draw the Court's attention particularly to the plaster of paris seal or bond 21. It will be seen that it is corrugated on its outer surface and fits into the helical corrugations of the casing which are formed there when the screw-thread is formed upon the neck of the casing, that is, the jacket, to receive the cup 25.

It will also be noted that the plaster of paris
207 extends down onto the shoulder of the bottle where the body of the bottle joins the neck, so that it is locked against downward movement relative to the bottle.

Then it is to be noted that the outer surface of the bottle flares outward upwardly parallel with the tapered cork 19. Your Honor will recall that Mr. Johnson, I believe, called attention to the outward flaring of the neck 21 of the Blair patented structure as being means for preventing a displacement of the bond 14 of that patent.

239 This Altenberg patent has precisely the same means for preventing the upward movement of the plaster of paris 21 relative to the bottle 1, that is the inner container 1. So the plaster of paris which forms the seal and bond between the inner container 1 and the jacket 20 is firmly interlocked on its exterior surface with the jacket 20, and upon its interior surface with the inner container 1. At the bottom of the structure shown in the Altenberg patent there is a felt packing or support which prevents downward movement of the bottle and cushions any shocks that may occur in that direction.

Between the inner container and the jacket there is a corrugated strawboard packing 23 which effectively protects the inner container from injury, from shocks and holds it against any undue vibrations that it might suffer if it were not restrained by this strawboard filler. There seems to be everything in this Altenberg patent that there is in the Blair patent in suit excepting the
208 single-walled vessel and a special form of insulated cap. The Altenberg patent uses an ordinary cork instead of a vacuum cap.

Comparing the upper end of the neck of the outer jacket 20 of the Altenberg patent and the relation which is shown in the patent to the upper end of the neck of the inner bottle of that patent, with the relation of the flange 6 of the Blair patent to the bottle 11 of that pat-

240 ent, they are identical. The upper end of the neck of the jacket 20 of the Altenberg patent is inwardly flanged in the same manner that the upper end of the jacket 4 is inwardly flanged in the Blair patent, and further, the insulation, the heat insulating bond 4 of the Altenberg patent is seen to extend up under the in-turned flange 5 of the outer jacket in the same manner that in-turned flange 6 of the Blair patent extends over the in-turned portion 13 of the bond 14 which is found in the Blair patent.

There is another feature of this Altenberg patent which I think I neglected to mention, and that is the two-part metallic shell which is seamed together at a point just below the reference number 3 in fig. 2. This is similar to the method of connecting the parts of the jacket 4 of the Blair patent in suit.

209 Patent No. 922174, J. G. Lyman, dated May 18, 1909, marked for identification as Defendant's Exhibit 5-H, is for a vacuum bottle. It has a metal outer casing or jacket (1) which is made in two parts, the sidewalls forming one part, and the bottom the other part.

241 The jacket is contracted at its top to form a neck which is threaded at 3 to receive the threaded end of cap 4. The inner container or bottle is double-walled, and a vacuum is formed between the walls as in the construction of the ordinary Thermos bottle. Surrounding the outer wall of the neck of the bottle is a collar 11 of plaster of paris which bonds and seals the neck of the bottle to the neck of the jacket. It will be noted that the neck of the bottle extends upward above the top of the neck of the jacket, which permits liquid from the bottle to be poured out without striking the seal 11, and thus adds to the efficiency of the bottle.

Between the jacket and the inner container—the jacket is referred to by the reference numeral 1 in the drawings—there is a non-conductor of heat filling or packing 7. The specification referring to this filling material states on page 1, commencing with line 79:

"Of course it will be understood by those skilled in the art that the insulting material 7 between the outer shell 6 and the casing 1 has to be securely sealed therein in order to prevent water or liquids leaking into this space and destroying in a large measure the insulating

210 effect of this material. For this purpose in the present instance, I employ a plaster of paris joining ring

242 11, located between the neck 3 of the casing 1 and the outer wall 6 of the liquid receptacle."

Thus Lyman in 1909 understood the necessity for sealing the neck of the inner container or the joint between the inner container and the jacket by a water proof heat insulating material which he describes as plaster of paris, but in the last paragraph of the specifications he says:

"It will now be apparent that I have devised a novel and useful construction which embodies the features of advantage enumerated as desirable in the statement of the invention and the above description and while I have in the present instance shown and described the preferred embodiment thereof, which has been found in practice to give satisfactory and reliable results, it is to be understood that the same is susceptible of modification in various particulars without departing from the spirit or the scope of the invention or sacrificing any of its advantages."

I take it from that statement that there is reserved to him the right to use any kind of material or equivalent construction that would come within the scope of his patent. As for instance, instead of using the plaster of paris, he could use any other kind of a bond that would serve the purpose.

243 Q. Calling your attention to Plaintiff's Exhibit 13 and to the upwardly extending exposed edge of the crock in its relation to the fastening ring, I ask you to 211 compare that with what you find in the Lyman patent and the relation of the neck of the bottle of that patent to the jacket or outer casing, and state what you find to be shown in that comparison?

A. The upward protrusion of the bottle neck above the neck of the jacket is the same in both the Lyman patent and in Plaintiff's Exhibit 13. There is this slight difference between them, in Exhibit 13 the metal of the jacket is inwardly flanged toward the neck of the inner container, while in the Lyman patent the metal of the jacket is not so inwardly flanged. The inward flang- 212 ing of the metal of the jacket of the Altenberg patent No. 900075 is for the same purpose as that in Plaintiff's Exhibit 13, to securely hold the jacket to the shoulder of the inner container.

Patent No. 1,002,009 to L. R. Steel, dated August 29, 1911, marked for identification as Defendant's Exhibit

5-I, is for a heat insulating tube or receptacle. This receptacle has a mouth or opening of the same diameter as the receptacle itself. The device comprises two con-
244 tainers, an inner food container 1, and an outer jacket, 2. Between the inner receptacle and the outer jacket there is placed heat insulating material which the specification on page 1, line 49 and following, refers to as of cork, asbestos or other material that is a non-conductor of heat. The space between the bottom of the inner receptacle and the bottom of the jacket is also filled with this heat insulating material. The cover of the receptacle *b* is formed in the same way as the body is formed, there being an inner receptacle 13 and an outer jacket 11, the space between them being filled with heat insulating compound 12. A conical screw-threaded surface at the top end of the body of the receptacle receives the correspondingly threaded end of the cover B.

I am talking about the L. R. Steel patent No. 1,002,009, dated August 29, 1911. It is a wide mouth container. There are two Steel patents.

245 Patent No. 1,067,072, also to L. R. Steel, dated
213 July 8, 1913, marked for identification as Defendant's Exhibit 5-J, is for a vacuum insulated metal milk can. Its construction is briefly described on page 2, commencing with line 13, as follows:

"The inner section is preferably of glass, china, or any other analogous substance and includes a circular bottom 25, from the periphery of which rises a circular side wall 26. The side wall 26 has a dome-shaped head 27 which terminates in a shouldered neck 28. The shouldered-neck 28 is exteriorly screw-threaded, the lower and larger portion of said neck screwing into the interiorly threaded neck of the outer casing, and the upper or smaller portion of the said shouldered-neck extending into the neck 23 of the outer section. It will be understood that cement or any well known means may be inter-
246 posed between the threaded portions above described so as to form there between a perfect air-tight joint."

Between the inner glass receptacle 25 referred to in the portion of the specification I have just read and the outer metal shell *a* of the milk can there is placed a sheet of perforated cork 29. The specification refers to this as a thin sheet of cork, asbestos or other equivalents and it says: "This non-heat conducting substance or

insulation comprises a body portion 29 and an upper dome shaped end portion 30."

Further in the specification, commencing with line 64 of page 2, this material is described as follows:

"The material 29 forms an insulation between the outer walls of the can and the inner glass receptacle and serves to effectively protect the inner glass receptacle should the walls 17 become accidentally punctured or otherwise partly mutilated in transit or destroyed to the extent where the partial vacuum is destroyed."

214 Between the inner glass receptacle and the outer jacket a partial vacuum is formed which is effected by attaching an air pump to the nipple 35 at the bottom of the jacket. This device has its inner container supported practically solely from its neck which is screw-threaded and cemented into the neck of the outer metallic jacket. The can has an insulated cover which is insulated
247 in the same way as the body of the can.

Referring to the statement in lines 25 to 29 at page 2 of the specification of this Steel patent, the cement referred to at that point bonds and seals, bonds the neck of the inner container to the outer container and seals the joint against leakage. The specification states that the space between the inner container and the outer container is exhausted of air so that it is very essential that this joint be hermetically sealed, not only against water, but against air pressure.

As to the presence or absence of a support for the bottom of the inner container of this Steel patent, there is no support for the bottom of the inner container and none for the side. It is entirely pendently supported from its top, that is, it hangs from the top, although it is rigidly fixed and not permitted to swing like a pendulum, it is rigidly fixed by the cemented threaded joint between the jacket and the inner container.

215 Patent No. 1,119,968 to St. Vrain Le Sieur, dated December 8, 1914, marked for identification as De-
248 fendant's Exhibit 5-K, is called a vacuum milk can, a double-walled metal vessel, there being a space 3 between inner receptacle 6 and the outer jacket 4 from which air is exhausted to form a vacuum. The inner and outer receptacles have their necks bonded and sealed by heat insulating means, including a ring 7 of wood and a ring 9 of rubber. Perhaps the most interesting part of this patent as relates to the present case is the cover 15,

the stopper portion of which is spaced from the inner wall of the neck of the bottle and rests upon the top of the rubber ring 9, and has no metal to metal contact with either receptacle. It contacts with the rubber 9, and has clearance all around the stopper portion between the stopper and the inner wall of the bottle neck. The cover is also a vacuum cover. The specification refers to this on page 1, commencing with line 71:

"The numeral 11 indicates a vacuum cover in the form of a hollow cylindrical body from which the air is exhausted. Said cover projects downwardly within the neck of the inner can to a point approximately even with the plane at the lower edge of said wooden ring 7,".

It is otherwise as I have described it. The cover and its relation to the heat insulated receptacle are the same as
249 the cover of the Blair patented vessel in its relation to the Blair heat insulated receptacle.

I find in this Le Sieur patent a heat insulated vessel having an outer jacket and an inner container provided with a neck. It has both of those features.

216 I also find in this patent a body of heat insulating material surrounding the container and a closure for engaging the neck of the container. The wooden ring 7 and the rubber ring 9 are these parts.

I also find in the LeSieur patent a container having its stopper separated from the inner wall of the neck by heat insulating air space. The stopper 11 is smaller in diameter than the orifice in the neck of the inner container and clears it.

Patent No. 1,161,266, to Sturges, dated November 23, 1915, marked for identification as Defendant's Exhibit 5-L, is for a milk can which is double-walled. There is an inner receptacle or container 6 and an outer jacket 3. Between the inner container and the outer jacket is a packing of heat insulating material which the specifica-
250 tion refers to as "ground cork, felt or the like." The bottom of the inner container 5 is spaced from the bottom of the jacket 2, and this space is filled with heat insulating material. There is a cover or stopper for the milk can which is double-walled and the space between the walls is filled with the same kind of heat insulating material 11. The inner receptacle is suspended from the outer jacket by a sealed seam or joint found at 8 in Fig. 2 of this drawing. There is no other support for the

inner container except the heat insulating material which is packed between it and the outer jacket.

Recess to 2:00 P. M.

251 217 Referring to Sturgis patent No. 1,161,266, the element 12 is referred to in the specification on the second page commencing with line 17, as follows:

252 "In order to properly space the inner can from the outer can during the assembly thereof, wood and fibre or other non-conducting materials in the form of small ring segments, blocks 12, are placed on the bottom of the outer can adapting the inner can to rest thereon and to be properly centered prior to the introduction of the insulating packing 11."

Before recess I referred to this inner can as being entirely supported by the suspension at the top; these insulating blocks 12, centering blocks or adapters escaped my notice.

Patent No. 1,119,772, to Engel, dated October 3, 1916, marked for identification as Defendant's Exhibit 5-M, is for a vacuum bottle in which the inner and outer walls of the bottle are sealed by a sealing member of rubber instead of being fused together.

This is referred to in the specification, page 1, commencing with line 44, reading as follows:

"Resilient seals in the form of rubber bands 9, 10 and 11 are employed, and after the air has been exhausted from the vacuum chamber containing the shells and while 253 the parts are in the position illustrated in figure 2, the liquid or plastic cement 12 is applied."

218 There are various forms of this invention shown in the drawings. In figure 1 the rubber is at the top, parts 9, 10 and 11, and the cement is at 12. The outer container is referred to as part 1 and the inner container as part 2.

In figures 5 and 6 are shown flared mouths of both the inner and outer containers and cement only is placed in the structure shown at 5. In figure 6 there is an additional sealing or supporting device of a rubber seal 28. Also, in figure 5 I was mistaken when I said there was nothing but cement there. I see that in figure 5 there is rubber at the part marked 22', the cement seal being 23. That shows that the use of rubber and cement to effect a seal and bond support, to pendulently support an inner

receptacle in the neck of an outer receptacle was known at the date of this patent application, December 21, 1915.

The specification on page 1, commencing with line 79, gives the advantage of the use of the rubber seals as follows:

"Another advantageous incident to the use of the rubber seals is that the inner shell is yieldingly supported and less liable to break than if such rubber seals were
254 not used. The upper rubber seals also serve to protect the cement seals from the action of air and water."

On page 1, commencing with line 107, the specification says:

"The support of the inner shell at its upper end is such that no additional supports are required between the two shells below their upper ends and as a result the bottle is not subject to the loss of efficiency due to the use of the usual pads or supports placed between the inner and outer shells."

219 Referring to the stopper designated by the numeral 3 in figure 1, and likewise to matter appearing on lines 29 to 34 of page 1 of the specification of the Engel patent, the stopper is a vitreous or glass stopper, and the air is exhausted from it for heat insulating properties. The specification, the portion to which you have referred reads:

"In the construction of figure 1, the reference numeral 1 indicates the outer glass shell, 2 the inner glass shell, and 3 the glass cork from which the air has been exhausted and which is provided with a coating 4 of cork to insure a tight joint between the cork and the inner shell or casing 2",

the cork affording a yielding adaptability to the differences in contour of the stopper and the orifice of the bottle.

255 With reference to the exhausted characteristic of stopper 3 of this Engel patent, compared with the form of stopper of the Blair patent, it is of the same type. In the Blair patent there is an air space between the stopper and the orifice of the bottle. In the Engel patent the cork is used to effect the seal between the stopper and the bottle as there are no flanges on the cork or stopper of the Engel patent by which the sealing could be otherwise effected.

Simonson and Blair patent No. 1,309,967, dated July

15, 1919, marked for identification as Defendant's Exhibit 5-N, is a substance and process patent. There are no illustrated drawings as they are not necessary for
220 an understanding of the process. The process is described as length and is referred to in the specification briefly, commencing with line 10 of the first page, as follows:

256 "Our invention relates to the induration and toughening of organic substances which are usually obtainable in the form of gummous exudates, lac being an exudate of the kind to which the invention is applicable.

The invention consists in a chemical process whereby such induration is initiated, and also in a slightly indurated product; and it further consists in a related thermal process by means of which the slightly indurated product is further indurated and given the great tenacity and adherence which certain uses require."

Then the formula for the material and the process is described in detail. The product of this patent is referred to in the Blair patent in suit on page 2 in the paragraph commencing with line 72, in which it states that the substance of which the bond is composed is preferably a prepared shellac which is fully described in United States letters patent 1,309,967, that referring to the bond 14 shown in the Blair patent in suit.

Patent No. 1,333,795, to Davis and Sunderlin, dated March 16, 1920, marked for identification as Defendant's
257 Exhibit 5-O, is for an insulated vitreous receptacle, which descriptive name applies as well to the Blair patented article, or to Defendant's article. There is an outer jacket 1 of metal, which is referred to in line 30 of the first page of the specification as follows:

221 "1 is a non-vitreous protective jacket, preferably made of sheet metal, rolled and bent into cylindrical form, the edges of the sheet being overlapped, riveted and soldered together in a usual manner.

2 is an inner lining or jacket, and 3 is a silvered vitreous container, between which and the inner lining 2 is a space for the reception of a non-heat conducting filling 4 which is preferably granulated cork, although it may be composed of any suitably heat insulating material."

This description applies to any of these heat insulated jugs with which we are concerned in this litigation. The opening of the inner receptacle is flared outwardly and

it is sealed as is described by the specification on page 1 commencing with line 64.

"A collar 8, having an inwardly extending flange 8a at its upper end and an outwardly extending flange 8b at its lower end, is secured to the neck of the vitreous container by a suitable bonding substance 9."

258 So that this outer surface of the inner container is bonded to the metal part o fthe jocket which constitutes the neck of the portion surrounding the neck of the inner container. The cover of the inner container or bottle is heat insulated in the same manner that the space between the inner container and the outer jacket is insulated. This cover is described on page 2 of the specification, the paragraph commencing with line 19 and continuing to line 75, which I will not read except in part. There is a statement commencing with line 54 of this paragraph, reading as follows:

222 "The only contact between the cover and the container is, therefore, through the medium of a substance having low heat conductivity. The sheathing 15 is anchored by means of its flange 15b in the body of cork, and is elsewhere spaced from the container."

It will be seen on close inspection that there is a clearance space between the body of the stopper and the outwardly flared wall of the bottle at its opening, and that there is insulation between the stopper and the receptacle wherever there has to be support for the stopper on the receptacle. The inner container is suspended entirely from the top and has no support at the bottom or side other than the heat insulating material which is

259 packed between the inner and outer receptacles. There is a brace 19a provided, its object being stated in the specification on page 2, commencing with line 85, as follows:

"The inner lining 2 is provided with an internal sheath 19 sustaining a brace 19a having a diagonal disposition to prevent the inner part of the receptacle from moving endwise within said jacket."

I might add there is an inner lining 2 which the specification on page 1, line 97, describes as follows:

"The lining 2 is preferably made of some yieldable substance, such as thin sheet steel coated with lead or tin, the object being to admit of the withdrawal of the lining and the associated parts, even though the protective

jacket has become deformed to such an extent that, if made of rigid material, it would prevent the withdrawal of such lining. Should there be difficulty in removing the lining by an endwise movement, the broken part of the container and the filling may first be removed, and a suitable tool then applied directly to the lining in order to free it from any interlocking portions of the protecting jacket."

That is an additional feature which is not found in the other constructions.

This Davis and Sunderlin patent has characteristics for permitting free and easy access to its interior to maintain the receptacle in a sanitary condition. It has a very large opening at the top to permit the insertion of the hand for washing or cleaning the interior of the bottle.

The Rood and Johnson patent, No. 1,362,740, dated December 21, 1920, marked for identification as Defendant's Exhibit 5-P, is for a heat insulated container. It comprises a multi-part metal jacket A and a frangible container B. There is a space between the frangible inner container B and the jacket A, which is filled with insulating and cushioning material of corrugated sheet cardboard or paper E. The specification describes this construction as follows, commencing at line 31 of page 1:

"Referring to figure 1, B is a receptacle having a contracted open neck, the latter supplied with a stopper D. A is a section container mounted about and spaced away from the receptacle B. E denotes one kind of elastic porous or chambered packing filling the interspace of the receptacle B and container A. C is a cup inverted and fitted upon the diminished upper part of the container A and covering the exposed top of the neck of the receptacle B with its stopper D."

The insulating material which is placed in this space between the inner and outer receptacle is described in the specification at page 1, commencing with line 73, as follows:

"The interspace of the receptacle B and its container A may be filled with a suitable flexible or elastic cushioning and porous material, preferably a non-conductor of heat. We have found that corrugated strawboard E is very suitable for the purpose, possessing the desired

qualities mentioned and having between the corrugations relatively small interspaces which are in effect dead air spaces, homogeneously distributed and a good non-conductor of heat."

Further commencing with line 95, the specification states:

"This kind of packing is very light and elastic, and cushions well against shocks from any direction, without settling or varying in homogeniety, and renders the device especially useful for carriage on vehicles where subjected to many shocks, or for employment by farm-
262 ers, mechanics, miners and others, the container A being provided with a suitable handle."

As to whether or not there is any reference in the Rood and Johnson patent to the use of this particular receptacle or container for other purposes than for the mere carrying of liquids, this object of the Rood and Johnson invention is found in the paragraph com-
225 mencing with line 9 of the first page, reading as follows:

"Our invention relates to improvements in heat insulated containers, and the object of our improvement is to supply a compact, portable and convenient device of this type, inexpensive in construction, easily dis-assembled for replacement or repairs, and otherwise most suitable in its construction for containing and keeping liquids or foods for a considerable time at a desired temperature."

It was therefore contemplated that food other than liquid may be carried in the receptacle, the mouth of the inner container being large enough to permit solid food to be placed in and taken out of the container.

Comparing the jugs in evidence as Plaintiff's Exhibits Nos. 6 and 13, with the construction of the Rood and
263 Johnson patent, their purposes and much of their constructions are alike, and the parts function the same. In the Rood and Johnson patent there is no seal or bond between the inner frangible receptacle and the outer metal jacket. That is, the only connection around the neck is a metal connection. There is no adaptor between the neck of the bottle and the neck of the jacket. The two exhibits to which you have drawn my attention, Nos. 6 and 13, have adaptors or fillers of low heat conductivity between the neck of the container and the neck of the

jacket to seal the opening about the neck of the bottle to prevent water or moisture getting in and prevent the powdered insulating material from sifting out. Such material is not found in the Rood and Johnson patent.

226 The specification of this patent refers to the filler between the earthenware crock and the jacket of the receptaccle as corrugated strawboard. In the use of that there would be no necessity for a seal or bond between the top of the outer jacket or casing and the inner container, so far as the sifting out of the insulating material is concerned. It might be desirable to have a fairly close connection around the neck of the bottle to
264 prevent water from getting in, but so far as keeping the insulating material from sifting out is concerned, it requires no seal or bond.

Patent No. 1,431,189 to Smith, dated October 10, 1922, marked for identification as Defendant's Exhibit 5-Q, is for a heat insulated receptacle. The inner container and the outer container both being of metal. The inner container is shown at 5 and the outer container at 6. The space between them is filled with finely divided insulating material. The description of the structure is found on page 1, paragraph commencing with line 45. The inner and outer vessels are connected together at their tops as by welding at the neck, this joint being indicated at 8, and the bottom closure comprises a plate 9, seen in the bottom of figure 1. This is a large mouted receptacle which will permit of the insertion of the hand to put food in or take it out, and to clean the interior of the receptacle.

There is an insulated stopper for closing the orifice of the bottle described on page 2, commencing with
227 line 37, as follows:

"This stopper member may be made hollow as
265 shown with a number of laminae of fibre or fabric of good heat insulating qualities indicated by the reference character 35 with an outer coating or covering 36 of vulcanized rubber or other material having good heat insulating qualities and adapted to make a good liquid-tight joint."

The inner container is entirely suspended from the top of its neck in pendent relation to the point where it is supported, there being no other support for it than

the granulated cork or finely divided material which fills the space between the two receptacles. It is proposed by the inventor to not only insulate the inner container from the outer jacket by the finely divided insulating material, but to also create a partial vacuum in the space, which adds to its insulating qualities. This is described on page 1, commencing with line 87, which I will not read.

This particular structure of the Smith patent possesses a very wide mouth, a large stopper, the large mouth permitting the insertion of the hand for washing the interior of the receptacle for maintenance of cleanliness and sanitary conditions.

266 Patent No. 1,497,764, dated June 17, 1934, granted to Simonson and Blair, marked for identification as De-
267 fendant's Exhibit 5-R, describes a vacuum insulated double-walled glass or vitreous receptacle in which the two parts, the inner and outer receptacles are not fused
228 together as is common practice in the construction of Thermos bottles, but instead they are cemented together by a particular kind of bonding material or cement. The method of preparing the cement is described at length in the specifications and illustrations of several differently constructed bottles or receptacles are shown in the drawings.

On the first page of the specification, commencing with line 17, there is to be found a statement of the objectionable features of the then existing method of making vacuum insulated containers, and then further, on the same page, is a statement in brief as to the nature of the invention of this patent. I will read the portion commencing with line 71 of the first page, as follows:

"We have found that the desideratum in the production of composite glass articles, is to unite the parts thereof under such thermal conditions that the original molecular dispositions will not be affected, and that, if affected in any considerable degree, the resulting expansion and contraction will be uniform throughout the entire structure.

This result, we have discovered, may be produced by employing a non-vitreous fusible bond, having a tenacity
268 approximating, or even exceeding, the tenacity of glass, which fuses at a temperature below the temperature at which the united parts will fuse, and has the capability,

when fused, of directly adhering to such parts, and of acquiring strong adherence when solidified.

When substances such as different kinds of glass, are united by fusion there is a blending of the molecules
229 due to the mutual miscibilities of the substances, but when only one or two substances to be united is fused the union is due to adhesion only, miscibility not being a factor."

There are 119 claims in this patent directed to the heat insulated jacketed vessel thus constructed, and to the combination of the vessel with the particular kind of bond used. There are a number of process claims covering the bonding of the parts together.

I might add further that in fig. 1 there is a good illustration of what this invention is, wherein it is seen the inner receptacle *b* is supported at its neck in the outer receptacle *a* by means of this bond C with practically no other vertical support. There are small braces E near the bottom of the inner receptacle which center it in the outer receptacle.

269 The French Patent No. 403,574, marked for identification as Defendant's Exhibit 5-S, is briefly described in the translation of its specifications, which I have, as follows:

"The present invention has as its object a device for keeping beverages in bottles hot or cold for a certain length of time which has the advantage over other bottles used for the same purpose of much greater strength and much less cost."

The bottle has a single-walled inner container which the specifications states may be of glass, aluminum and so forth. There is a sheet metal jacket or envelop 3 surrounding the bottle and spaced from it, the space be-
230 ing filled with heat insulating material such as corrugated cardboard, charcoal, cork waste, asbestos, silk waste and so forth. This is the space which has the reference numeral 2 in the patent drawing.

The bottom of the bottle is supported by what is called a cross beam 4 secured to the bottom of the jacket. The neck of the bottle is provided with a shoulder, and under this neck of the bottle the metal jacket is inturned and supports the bottle in pendent relation from the top.

270 In fig. 2 there is shown a modification in which the glass bottle is contained in a space and does not contact with

the heat insulating material directly, there being two spaced jackets, and the space between them being filled with the insulating material seen at *b*.

The French patent No. 411,568 to Lodo and Gassend, marked for identification as Defendant's Exhibit 5-T, is a heat insulated jug or bottle, the inner receptacle being made of glass or other vitreous material and the outer jacket being made of sheet metal. The space between the inner receptacle and the outer jacket is filled with heat insulating material which is described as follows in the copy of the translation which I have:

"Inside is placed the receptacle 13 (of glass) that is to be protected; it is separated from the outer envelop by a layer of triturated cork 14 which fills up all the spaces and which is retained by a closure also of cork, 15, placed on top."

231 And further the specifications state:

"The triturated cork is an excellent heat insulator and, as such, retards all rapid heat exchanges between the inside and outside; it therefore acts as a shock absorber and as a heat insulator."

271 There is a portion of the space between the inner and outer receptacles which is seen at the part marked 15 which is described as being of cork. I presume that this is of solid cork as it is referred to as a retainer for the triturated cork in the part of the specification which I read. It therefore acts as a seal to prevent the triturated cork from sifting out, and is of course, a seal to prevent the entrance of water or moisture.

The top of the neck of the jacket is pressed in about the neck of the bottle under the shoulder surrounding the top of the bottle. There appears to be no separation of the metal from the bottle at this point.

The jackets of the two devices shown in figs. 1 and 2 respectively, are multi-part jackets, the seams being found at the points where it would be convenient to make separate parts of the jacket.

Mr. Cromwell: I now offer in evidence all of the several patents which the witness has discussed as Defendant's Book of Patents, the offer being made with respect to all of these patents collectively and individually. In connection with the two French patents, there are two translations which accompany these patents, and I have

272 stated to counsel for the other side that if there is
232 any question as to the correctness of the translations, there will be no difficulty about counsel getting together and determining on that score.

Mr. Millar: That is agreeable about the translation part. We object to the introduction of Defendant's Exhibits 5-O and 5-R, being patents issued to Davis and Sunderlin No. 1333795, and the patent issued to Simonson and Blair No. 1497764, on the grounds they are not prior art. They were not pending applications in the patent office at the same time, and to be admissible at all, it must be on the basis of prior invention; they are admissible only on the basis of prior invention. They were not available to the public at the time the Blair application was filed, and are not prior art.

Mr. Cromwell: The defense of prior invention, your Honor, has been pleaded, and these patents, from their filing dates under the stipulation entered into by Counsel establish the date of invention as of the filing dates of those cases. So until those patents have been overcome with respect to those filing dates, they stand as perfectly valid references under the defense of prior invention, just the same as any other patent.

273 Mr. Millar: Evening assuming what counsel says is true, they they may stand as invention under the stipulation as of the dates of their filing, they are still not prior art, they were not available to this inventor nor the
233 public at the time he filed his application; but if they are inventions, of course, they are invention from the day the applications were filed:

Mr. Cromwell: We are not citing them or setting them up as prior art, your Honor. We are setting them up in support of the defense of prior invention.

Mr. Haight: Thus limited they should be admitted, but limited to that purpose.

Mr. Cromwell: Well, that's all we want.

The Court: You gentlemen speak of many things which I don't know very well. I think they may be admitted, and, if there should be some limitation of their use, if either side thinks there should be some limitation of their use as evidence, they may call the Court's attention to that limitation in their brief.

Mr. Cromwell: We shall support with abundant authority, your Honor, the citation of these patents under

the defense of prior invention. There is no question about that.

274 (Said documents received in evidence, were marked DEFENDANT'S EXHIBITS 5, 5-A, 5-B, 5-C, 5-D, 5-E, 5-F, 5-G, 5-H, 5-I, 5-J, 5-K, 5-L, 5-M, 5-N, 5-O, 5-P, 5-Q, 5-R, 5-S, 5-T, and are in words and figures following).

275 234 We find in the Blair patent the term "Bond" and "Bonding" employed there in various relations. Webster defines the word "bond" as "that which binds, ties, fastens or confines." The verb is defined as "to hold together or solidify by, or as if by, means of a bond, or of a binder." And the illustration is given of the use of the word as follows: "The track is free from dust and vegetation but the ballast does not seem to bond well."

The term "bond" as used in this patent appears to be a substance that will unite two parts together by its adherence to the two parts. That is the characteristic of the bond which is described as preferable in the Blair specification, page 2, commencing with lines 72 and running to 107. It would seem that the bond or bonding material must have great strength and adhesive properties, capable of sustaining the inner receptacle in its position in its pendent relation to the jacket without other support, and that this bond must also seal the joint between the inner receptacle and the jacket.

276 The seal called for in the Blair patent, particularly the last clause of claim 18 and the last clause of claim 17, is a seal to prevent moisture from reaching said insulating material. That is the insulating pulverized cork 31 235 which is between the inner receptacle and the jacket; that the seal is simply a watertight closure for keeping moisture out of the heat insulating material between the walls of the inner and outer receptacle.

Referring to the matter appearing on lines 27 to 37 of page 2 of the Blair patent in suit and especially to the phrase "pendulous movements" in the Blair patent in suit, the term "pendulous" is defined in the Century Dictionary as "hanging loosely or swinging freely from a fixed point above. Hanging. Swinging loosely, or loosely pendent." The term "pendulous" is defined as "anything that hangs down from a point of attachment and is free to swing." Therefore, a pendulous movement is one like that of a pendulum which is pivoted at one point of suspension, and it is free to swing about that point. It

is not a fixed rigid support at the top of an object, but it
277 is such a support that the object may swing like a pendulum.

This part of the specification states that the space between the inner container and the jacket is filled with a comminuted substance of poor heat conducting property such as cork, and this substance is packed with sufficient density to prevent violent pendulous movement of the container occasioned by shock administered from without the receptacle.

I cannot conceive of there being any pendulous movement, especially any violent pendulous movement of the inner receptacle, especially if the bond 14 has the
236 qualities that it should have to suspend the inner container inside of the jacket. If the bond were soft and plastic and the inner receptacle were supported by some other means at the top, then there might be some pendulous movement, but the only movement that could be imparted to the inner receptacle, so far as I can see, is that of vibration or deflection or deforming by outer shocks, which movement would be resisted by the heat insulting material which surround the inner vessel.

Referring to the term "pendulous movement" as used in the specification of the Blair patent in suit, as applicable to the container 11 of that patent or as aptly describing any movement that container might have if there is any possible movement to that container, in my
278 opinion the term "pendulous" is meaningless in connection with this construction. The heat insulating material surrounding the inner receptacle does cushion shocks from the outside that might otherwise destroy or crack the inner receptacle, but such shock would not cause pendulous movement of the receptacle regardless of how loosely the heat insulating material might be disposed in the space between the inner receptacle and the outer jacket.

Referring to Defendant's Exhibit 1, as to any capacity for pendulous movement of the broken crock structure with reference to the cap of the jug to which it is attached, there is positively no possibility of pendulous movement, as the sulphur filler between the inner container and the jacket is so rigid that there can be no pivotal movement of the vitreous container relative
237 to the jacket. It is so rigid that the aluminum jacket portion which is attached by the sulphur to the neck

of the inner container can be bent very much out of shape without any movement whatever between the sulphur and the inner container neck.

279 (Copy of page 507 of Knight's American Mechanical Dictionary, published in 1874, together with the title page of that publication, offered and received in evidence as DEFENDANT'S EXHIBIT 6, in words and figures as follows:)

280 *Cross-Examination by Mr. Millar.*

I have had no experience in the manufacture of heat insulated receptacles.

It is a fact that between the two glass walls of the Berger and Aschenbrenner patent No. 13093, there is a vacuum. That vacuum is an efficient heat insulator. The heat insulating properties of that receptacle would be destroyed if the outer wall of the inner receptacle is removed. The heat insulating properties of that receptacle would be slightly destroyed if the outer jacket of the receptacle is removed. After you removed the outer metallic jacket, you would still have a double-walled con-
281 tainer with a vacuum disposed between those two walls. I have not testified that the insulating properties were between those two glass walls. I have testified that there is insulating property in the vacuum, but I have not testified that all of the insulating property is there.

238 If you remove the outer metallic jacket and hold in your hand a vacuum double-walled vessel with an insulating vacuum between those two walls, it would be a thermally efficient heat insulator, but not as efficient as it would be with the outer jacket with the air space or insulation between the outer wall of the vacuum bottle and the jacket.

I know that a vacuum insulated container is a more efficient heat insulator than a packed container, but when you have a packed container added to the vacuum insulated receptacle you have additional heat insulation which is present in this Berger and Aschenbrenner construction.

282 If you remove the outer metallic jacket of the Blair device and the heat insulating material falls away, you have destroyed its insulating properties.

There are two glass walls and one metal wall in Berger

and Aschenbrenner. Three altogether. There are two walls in Blair, one glass and one metal.

It is a fact that in Berger and Aschenbrenner the cushion or protector mentioned by the inventor in the specification and the claims is not described as a seal in that patent.

283 The word used to describe "*e*" by the inventor in the Berger and Aschenbrenner patent is cushion or protector, I used the word "seal" for that element.

239 I testified on direct examination in this case as follows, with respect to the Berger-Aschenbrenner patent:

"Q. Now, according to the statement appearing in lines 63 to 65 the material '*e*' may be of different characteristics, that is to say, the specification states they may be cotton, wool, asbestos or the like, or of colophony, shellac, sealing wax, or other suitable rigid material. Comparing the cushion of the protector '*e*' of the Berger
284 and Aschenbrenner patent with the so-called bond of the patent in suit, what is your notion as to the similarity or dissimilarity of those two bonds."

"A. Aside from the fact that the patent in suit refers to a specific composition of bond patented in the Simonson and Blair patent 1309967, this material '*e*' is for the same purpose and undoubtedly could be of the same composition as the Simonson and Blair patent bonding material. Its function is the same and it is located in the same identical place between the neck of the inner container and the neck of the jacket."

I mean for you to understand that that cushion in element "*e*" is located so that it will prevent moisture from entering the insulating means in the Berger and Aschenbrenner device. It does seal the space between the inner receptacle and the jacket which is in part an insulating space.

285 I know very well that the heat insulating means in this vacuum bottle described by Berger and Aschenbrenner is the vacuum between the walls, but this is a mechanical structure that I am dealing with.

If the element "*e*" is removed from Berger and
240 Aschenbrenner, no moisture will get between the double glass walls.

If the bond is removed in Blair, moisture might get

between the walls wherein the insulating medium is contained, between the glass and the metal.

286 In the Clark patent Number 46640, it is correct that there is no in-turned flange at the top of the neck of the jacket projecting over the top of the neck of the container in that device. I think it is correct that there is no disclosure in the Clark patent of means uniting the metal container and the jacket which could be employed in joining a glass or earthenware container to a metal jacket. In those two respects, at least, Clark differs from Blair.

Referring to the Moore patent No. 184256, I testified on direct examination that a bond could be used to pendently suspend the bottle in the jacket. The Moore pat-
287 ent does not describe a bond to be used for that purpose. The Moore patent does not say that the bottle is pendently sustained. The Moore patent does not say that this bottle is heat insulated. In those two respects, in the specification, Moore differs from Blair.

In the patent of Heath No. 211092, page 1 and 9
241 of the specification, the inventor therein described the object of his invention to be, "the object sought for being the prevention of breakage during transportation." In that specification there are no words used by the
288 inventor designating the packing material to be heat insulating as such.

In the patent of Clisbee, No. 358732, the inner container is made, as designated in the patent, of copper tinned on the inner surface to resist corrosion. Copper is a conductor of heat. Referring to the drawing the spigot *r* projects through the inner container and through the outer jacket. That spigot is a good conductor of heat, and the spigot is a path of heat conductivity not found in the Blair patent. I do not find in the Clisbee patent a disclosure of any means that could be used for joining metal to glass or other vitreous material.

289 In the Fox patent, No. 138439, plaster of paris may become a mechanical bond by interlocking in the manner that Mr. Johnson described in connection with the bond 14 of the Blair patent, between the glass receptacle and the jacket.

The plaster of paris plug *b* in fig. 2 or in fig. 1 of the Fox patent, in so far as it is interlocked with the members between which it stands, is a mechanical bond. It would undoubtedly be interlocked with a wooden box,

and as to its being interlocked with the glass, it
290 242 would depend upon the irregularities of the surface of the glass.

As shown in the drawing, I cannot point out to you any portion of that block which indicates it is interlocked, unless you invert the whole thing.

I have seen many carboys.

Q. Very heavy, aren't they?

A. It depends upon the nature of the material that you care to transport. Some of the carboys I have seen were 20 inches in diameter and perhaps 20 to 24 inches high. The one I saw had a capacity of five gallons, I think. I don't know. There are various capacities of them.

Most acids are heavier than water. I do not know what the weight of a carboy such as I saw, filled with acid heavier than water, would be. It would be pretty
291 heavy.

If you remove the bottom of the box encasing the Fox carboy and lift it by holding the box, the carboy probably would come out of the box. The Fox carboy is not pendently supported in that box as a carboy. In the Fox specifications or claims it is not indicated that this is a heat insulated receptacle.

The patent to Henn, No. 884582 is not a single-wall non-vacuum type heat insulated receptacle. It employs the vacuum principle of heat insulation.

292 The vacuum insulating means in Henn is between
243 the inner wall *a* of the container and the outer wall *b* of the container. The air space between the outer wall *b* of the container and the jacket *e* is also an insulating means.

293 In the specification I find no reference to the space between the container A and the glass outer wall B as being filled with a comminuted material for preventing convective air currents or for eliminating oscillations of the container A. This is another vacuum bottle. The elimination of the plaster of paris disposed around the neck of the double-walled glass vessel would not allow moisture to enter between the two glass walls of that vessel.

The patent Altenberg, 900,075, is a vacuum bottle. The chief insulating means is between the two glass walls of the inner container. If you remove the outer protec-

tive metallic casing from Altenberg, you still have a thermally efficient heat insulated receptacle as efficient as
294 the vacuum makes it. That makes it pretty efficient, except in this completed structure, there is an added thermal efficiency due to the air space and the corrugated board in that space.

Mr. Millar: If the Court please, I ask to have the answer beginning with the word "except" and what follows stricken.

The Court: I let my mind wander. What was it?

(Record read by the reporter.)

244 The Court: I will let it stand.

Mr. Millar: Q. Does the plaster of paris plug as employed in Altenberg seal the walls, the glass walls of the inner container in any manner?

A. I don't understand your question.

Q. I will withdraw it. Is the plaster of paris which is disposed between the outer wall of the inner container and the jacket so placed that it serves to seal the vacuum bottle filler?

A. The last word I didn't get.

Q. Filler, f-i-l-l-e-r, filler.

A. There is no filler in the vacuum bottle.

Q. No filler in a vacuum bottle. Does the plaster of paris disposed around the neck of the double walled glass vessel in Altenberg and between that neck and the neck
295 of the jacket serve to seal the two glass walls of a double walled vessel?

A. I don't understand your question, Mr. Millar. Do you mean to seal them together, to seal the two glass walls together, or do you mean to ask if it seals either wall with reference to something else?

Q. Does it seal either of those glass walls to the other glass wall?

A. No, it is not in the vacuum space. As I understand your question, my answer is no.

If that plaster of paris substance were removed no
245 moisture would thereby be enabled to enter between the two glass walls of the inner vessel.

Q. Now, will you kindly turn to the patent to Lyman, 921,274, that is also a vacuum bottle, isn't it?

A. Yes.

Q. It has three walls, is that right?

A. It has the double wall glass receptacle and the single wall jacket.

Vacuum bottles of that type with which I am familiar are frail by nature and the glass is very thin.

Referring to the drawing, the inner double walled
296 glass container rests upon the bottom of the jacket, the outer surface of the outer wall of the vacuum bottle rests upon the bottom of the jacket.

The patent to Steel 1,002,009, the material of which the inner container is made, the specification on page 1, commencing with line 37, says:

"Referring to the drawing A designates the position of the insulating tube or receptacle, and B cover or closure therefor. The receptacle or tube being shown empty, but it is to be understood that a glass bottle or other container shaped to fit the body A is adapted to be used in connection with the tube or receptacle."

I do not think the specification of this patent discloses any means suitable for joining or uniting such a glass container to a metal jacket.

246 Referring to the other patent to Steel No. 1,067,072, page 2 of the specification, beginning at line 19, reads:

297 "The shouldered neck 28 is exteriorally screw threaded, the lower and larger portion of said neck screwing into the interiorally threaded neck of the outer casing, and the upper or smaller portion of said
247 shouldered neck extending into the neck 23 of the outer section. It will be understood cement or any well known means may be interposed between the threaded portion above described so as to form there between a perfect air tight joint";

and I am of the opinion the inner container is supported more or less loosely by the screw thread and bonded to effect a tight joint by means of the cement.

As to whether I testified that a glass bottle or earthenware jar cannot be made perfectly round, I don't know that I said it could not be made but it would be very difficult and expensive to make a glass bottle or an earthenware jar perfectly round.

Q. So that the construction as shown in the Steel patent of connecting the neck of the glass container and the metal jacket by screw threads would be more or less

298 impractical if the intention is to hold a vacuum between the walls, isn't that right?

A. Not if the cement was used to fill the interstices.

Q. Do you know of any cement that will hold a vacuum?

A. Well, plumbers use red lead, litharge and various concoctions to make gas tight or air tight joints which will hold more or less of a vacuum.

Q. More or less. How much of a vacuum will it hold?

A. Oh, such fittings are made to hold extremely high vacuum.

Q. Extremely high vacuum?

A. Yes.

248 Q. Do you know what is considered a perfect vacuum?

A. I don't know the exact figures. It is in the neighborhood of 29 inches of mercury, 29 or 30 inches of mercury, depending upon the ——

Q. Do you know how many inches of mercury are commercially considered as constituting an insulating vacuum?

A. I do not.

Q. You do not know that. Do you know whether or not metal as used in the jacket of the Steel can unless it be vitrified will hold a vacuum?

A. May I hear the question, please?

(Question read by the reporter.)

299 A. I don't know the nature of the metal used in the Steel can, Mr. Millar, but if the metal were perfectly made it would hold a vacuum.

Mr. Millar: Will you read the answer?

(Answer read by the reporter.)

Q. Would it hold an insulating vacuum?

A. That would all depend upon the dimensions of the can.

Q. Do you know the usual size of milk can used for the purpose described by Steel?

A. There are many sizes.

Q. Do you know the usual metals used for that purpose?

249 A. Yes.

Q. Name some of them.

A. They are tinned steel, generally.

Q. And which of those two metals do you think would

hold a vacuum if used as the outer jacket in the Steel patent, the device disclosed by the Steel patent?

A. May I explain my answer, your Honor?

The Court: Yes.

The Witness: If one were to design a milk can in accordance with the Steel patent, he would proportion the dimensions of the metal and use such character of metal as would be adapted to perform the functions and carry on the duty required of it. So that it is unfair to ask if the ordinary metal used in milk cans would be suitable for this Steel patented structure.

00 250 Mr. Millar: Q. I am asking you, Mr. Sessions, if you know of any metal that has ever been used in a milk can that will hold an insulating vacuum. Yes or no, please.

A. I know of metal that will hold as nearly perfect vacuum as can be maintained or produced by ordinary pumping.

Q. Name one of them.

A. Steel.

Q. What is that?

A. Steel, monel metal.

Q. And tell me, will ordinary pumping produce an insulating vacuum?

A. It depends upon what you call ordinary pumping.

Q. I am using the words you used, Mr. Sessions, I am asking you.

A. I have already said I did not know what an insulating vacuum is. Therefore, if you will tell me the extent of the insulating vacuum I might be able to state, but I have already stated that I know of metal that will hold as nearly perfect vacuums as can be made by the usual forms of vacuum pumps.

Q. Mr. Sessions, you are testifying here, are you not, as an expert on vacuum bottles, and you now state that you don't know what an insulating vacuum is, is that right?

A. That is correct.

Mr. Cromwell: That is an incorrect statement, if the Court please. He never qualified as an expert on vacuum bottles.

01 251 Mr. Millar: He is testifying as such, he is testifying about vacuum bottles as an expert.

Mr. Cromwell: You said he was testifying as an ex-

pert as to vacuum bottles and he has never been qualified as such.

The Court: By the way, what is an insulating vacuum?

Mr. Millar: We will prove that, if the Court please. I don't want to inform the witness now, he might take advantage of me.

The Witness: I could tell your Honor, if you will permit me to.

The Court: I think we will recess at this time. Come in at 10:15 tomorrow.

(Adjourned to Friday, October 27, 1933.)

302 252 The specifications of the patent St. Vrain Le Sieur, No. 1,119,968, calls that a vacuum milk can. The specification does not disclose of what material the inner
303 container is made.

The statement to which you refer, lines 43, 44 and 45 of page 1, states:

"The outer can 1 is made of very strong sheet metal and is provided at the base of the breast with the usual strengthening hoop 4."

Considering the entire paragraph, beginning at line 38, the statement is:

"It is very important, in a vacuum milk can, that the inner can be insulated from the outer can, to prevent the conduction and radiation of heat from the external can to the internal can, and in carrying out my invention I have carefully insulated the inner can, so that it will have no metallic connection whatever with the external can."

After reading those lines and what is shown in the drawing, I am of the opinion that both the outer and the inner cans are made of metal, and the metal of which
304 the inner can is made is a conductor of heat.

As to any means disclosed in the Le Sieur patent which would be suitable for joining metal to glass or other vitreous substance if, by "joining" it is meant that there be a firm strong mechanical connection, I doubt if
253 the means shown for joining the two cans in the Le Sieur patent would serve. If, by "joining" a sealed connection, a bonded connection is intended, then it would appear that the rubber gaskets 9 and the cement 8, would serve the purpose between an outer metallic can and an inner glass or other vitreous can.

In the patent to Sturges, No. 1161266, the inner con-

tainer as disclosed there is not made from any vitreous substance. It is not a fact that there is no disclosure in the Sturges patent of means for uniting the metal container and the jacket which could be employed in joining a glass or earthenware container to a metal jacket.

305 In the patent to Engel, No. 1199772, the disclosure refers to a vacuum bottle. I do not find a multi-part outer metallic jacket disclosed in that. I do not find any comminuted material between the walls of the jacket and the container in Engel.

In the patent to Rood & Johnson, number 1362740, the container as disclosed by Rood & Johnson is not suspended by the neck. I find no bonding element between the necks of the jacket and the container. The outer jacket has no in-turned flange extending over any portion of the neck of the container. The receptacle does not have a screw-threaded collar. The neck of the jacket is slightly conical to fit the neck of the glass inner re-
254 ceptacle. The upper end of the neck is not round or
306 cylindrical. To be strictly correct, it is frusto-conical. The upper edge is circular.

I do not recall testifying that there would be a closed connection there which would prevent water from entering a bond, which I called an adapter. In view of my previous testimony that it is practically impossible to make an earthenware container round, or a glass bottle, I account for my statement that you could make a closed connection there at the neck, which would prevent the seepage of water, by the use of a cement filler or connection. I do not find any cement filler there. I believe this was the purport of my testimony: if waterproofing were desired, a cement could be used at the joint.

Referring to the patent H. M. Smith, 1431189, it is
307 a fact that the inner container of that device is made of metal and the inner and outer container are welded together. Welding is available for uniting the jacket of a metal contained to the neck of a frangible container, such as glass or earthenware, but I doubt if it is practical for such a thing. I have seen it done.

There is no disclosure in this patent of means suitable for joining a metal jacket to glass or earthenware.

Referring to the French patent, Primas-Gesell Schaft, 403,575, fig. 1, it is a fact that the container is
255 supported from the bottom by the element 4. Referring to fig. 2, it is a fact that the container rests

upon the bottom of the jacket, and the bottom of the jacket
308 is removable. In neither of these figures are the container and the jacket united by a bond.

As to whether the supporting element 4 in fig. 1 and the contact between the bottom of the casing and the bottom of the container in fig. 2 would each serve as conductors for the dissipation of heat, the particular features to which you have directed my attention are not found in Blair. The extent to which they would serve as conductors of heat would depend upon the conducting properties of the parts.

Referring to the French patent to Lodo & Gassend,
309 No. 411,568, the sealing element 15 is disposed at the base of the neck. There is no bond or seal at the top of the neck between the jacket and the neck of the inner container. Element 15 is made of cork. Holes are indicated by 9 of fig. 1. There is an air space extending around the neck of the container above 15, and the air can circulate through the holes of 9. Moisture can enter the holes of 9. Convective currents of air may circulate in the air space surrounding the neck of the container above the element 15.

Having in mind all of the patents with respect to which I have been interrogated, other than the patent in suit, I do not find in any one of those patents to which I have referred, all of the elements of the invention or inventions
310 of the Blair patent in suit. There is no single
256 patent that is outstanding as the best reference against Blair.

Redirect Examination by Mr. Cromwell.

Q. You have stated in connection with the Burger and Aschenbrenner patent the element *e* seals the space between the inner receptacle and the jacket which is in part an insulating space. How does that particular relation of this element for sealing purposes compare with the so-called seal of the Blair patent in suit?

Mr. Miller: I object if the Court please as not being redirect examination.

The Court: Didn't he tell us that on direct?

Mr. Miller: He was not interrogated on that.

Mr. Cromwell: If the Court please, here is a question on his cross:

"Now, do you mean to tell this Court that that cushion or element *e* is located so that it will prevent moisture
311 from entering the insulating means in the Burger and Aschenbrenner device?"

The Court: I remember that. That was between the outer casing and the vacuum insert.

Mr. Cromwell: That's right, your Honor. Now I am redirecting him with respect to his statement here. He says: "Yes, I will answer that. It does seal the space between the inner receptacle and the jacket which
257 is in part an insulating space."

What I am trying to find out is the comparison of that, if the Court please, with the disclosure of the patent.

The Court: If you are relying upon the seal, shouldn't you have brought that out in your direct?

Mr. Cromwell: I have not any doubt that it was.

The Court: It is either there, or should have been there, unless you tell me you have forgotten it, of course.

Mr. Cromwell: I am quite positive it is there; but the point is I want to clear it up.

The Court: Objection sustained.

In the Burger and Aschenbrenner patent, so far as the admission of moisture is concerned, if moisture entered between the in-turned lip of the outer jacket as that lip is
312 related to the neck of the inner container, it would be prevented from entering further into the outer jacket by the packing *e*.

Q. What, if any, value would fine cork chips have as an insulating material?

Mr. Millar: I object to that, if your Honor please. I don't think that is redirect examination.

Mr. Cromwel: I am talking with reference to the discussion of the Heath patent, your Honor, page 287.

Mr. Millar: I make the same objection.

258 Mr. Cromwell: The question is: "Will you kindly refer to that specification and point out to me any words used by the inventor designating the packing
259 material to be heat insulating as such." There is no such mentioned.

The Court: Where is this?

Mr. Cromwell: At page 287, of the record. I am just reading the question from the record.

The Court: I remember that question. What is your question?

Mr. Cromwell: I am asking him as to the heat insulating value of the fine cork chips.

Mr. Millar: If the Court please, the question on cross examination was directed to words in the specification. Now he is asking him about the function of a material.

313 Mr. Cromwell: Well, if it comes to the question of relating it to the patent, I will say as set forth in the Heath patent which you have discussed.

The Court: He may answer.

A. Fine cork chips are an excellent heat insulating medium or a poor conductor of heat.

Mr. Cromwell: Q. In your cross examination you were asked with reference to the Fox patent.

'Now, assume you remove the bottom of the box encasing the Fox carboy and lift it by holding the box, would the carboy come out of the box?' And your answer was 'It probably would.'

Will you state whether or not the position of the Fox carboy to which the question on cross-examination was directed would be a normal condition or position of that carboy and the use of the same?

A. The condition of having no bottom in the box would be entirely abnormal or accidental, and not in any sense normal.

With reference to the Altenberg patent, when I was asked 'Is the plaster of paris which is disposed between the outer walls of the inner container and the jacket so placed that it serves to seal the vacuum bottle filler' and my answer was 'There is no filler in the vacuum bot-

314 260 tle', I meant by that answer, the vacuum is exhausted of air to a certain extent, and there is no material within it that serves as a heat insulator, aside from what little air there is left in it, and some spacing blocks 11, which are only positioned at spaced points. There is nothing in that vacuum space to be affected by any leakage into it; other than that would be affected by having water in the space, that would become a conductor.

"Q. What is the fact as to the disclosure of the other patents generally considered and collectively considered,

with respect to all of the elements of the Blair patent in suit."

Objection.

Objection overruled.

"A. There are many patents among the references that I have discussed that disclose features and constructions and parts that perform functions identical with the features and constructions and functions performed by the parts of the Blair patent in suit. The Heath patent 211092, is roughly capable of doing everything that is done by the Blair patent. It is not a refined piece of
15 apparatus. It lacks a bond between the neck of the inner vitreous bottle and the metal container, but it has the comminuted packing between the bottle and the jacket. It is supported from the top—"

The Court: Isn't that just a repetition of his direct?

Mr. Millar: Of course it is.

Mr. Cromwell: No, it is not, your Honor.

The Court: With respect to the Heath patent?

Mr. Cromwell: Yes, I will say that, your Honor.

The patents which I had in mind in giving my last
261 answer are the Heath patent 211092, the Clisbee patent 358732, the Fox patent 438149, and this Altenberg patent 900075, the Lyman patent 922174, the Burger and Aschenbrenner reissue patent 13093. Without going into detail, it is my opinion that these patents disclose all of the features and functions of the Blair patent in suit.

16 CARL S. MINER, called as a witness in behalf of the defendant, testified as follows:

Direct Examination by Mr. Cromwell.

My name is Carl S. Miner. I reside at Glencoe, Illinois. I am a consulting chemist, located in Chicago. The application of chemistry to the problems of industry, in a rather broad way describes the general character of the work I do in the exercise of my profession. I graduated from the University of Chicago with the degree of Bachelor of Science. I have been engaged in the practice of my profession something over twenty-five years as a consultant. My organization is known as the Miner Lab-
17 oratories, located at 9 South Clinton Street.

I can identify the device you hand me.

(Article marked for identification as Defendant's Exhibit No. 7.)

I would think of it perhaps as an icy-hot receptacle, a receptacle for maintaining temperatures of the
262 liquids put into it.

Defendant's Exhibit No. 7 for identification was handed to me by yourself on Monday of this week at my laboratories. It has been in my possession since that time. I was asked to examine the material that is between the metal outer can and the ceramic material jug that is inside. Those two meet at what I would refer to as the neck and are separated by a dark brown material of the nature of neither one.

318 In pursuance of those instructions, I tore away the metal collar and examined the material that was between the metal and the ceramic ware with a view to determining whether or not it adhered to one or both, and found that it adhered to neither. What I mean exactly is that when I removed the metal that was on the outside of this material the material fell away from the jug, the earthenware jug inside. That is there was not sufficient bond between the two so that I had to use any force except force of gravity to separate them.

On the top of the earthenware jug the grooves on the exterior appear to me to serve the purpose of aiding in supporting or in forming the bond between the metal and the jug. That is, there are grooves in the metal neck and grooves in the earthenware neck and the material which is between the two has seemingly been poured in between when it was in a molten condition, has flowed into the groove of the metal and of the earthenware, and forms a mechanical—by that I mean to distinguish from an
263 adhesive—bond between the two.

319 Mr. Cromwell: I ask plaintiff's counsel whether or not they are willing to stipulate that Defendant's Exhibit No. 7 for identification is one of the jugs of the Mantle Lamp Company, one of its commercial jugs.

Mr. Millar: We admit that Defendant's Exhibit 7 for identification was manufactured by The Mantle Lamp Company.

Cross-Examination by Mr. Millar.

To remove that outer metalic casing around the neck, I had one of my men cut that away with a hacksaw as can be seen at the side. The hacksaw was applied at the point at the beginning of the metal neck and after that had been sawed through the metal neck was bent back and the material allowed to fall out of place. I was present at the time that was done. I was there during the entire period of that operation. I examined the cut so
320 made before the rest of the neck was sawed away.

The appearance of the material inside of the metallic neck at the time the original cut was made, the material was as the piece which I have just removed, a complete section of the material, perhaps, about the same length as the one I hold in my hand, which is about an inch long.

The depth of the cut made with the hacksaw was merely sufficient to pass through the metal.

264 The material similar to the piece I now hold in my hand was not disposed around the entire neck of the container between the neck of the jacket entirely extending around the neck, at the time I received it. A small section of it had been cut out before it came to me. Except for that portion it appeared to be intact. I could not see what was covered by the metal. So far as I could see, it was intact except as it was broken vertically at the point, at the end inside of the metal. That was what enabled me to take it off. It was after I tore away the neck that the material to which I have referred fell away.

321 There was every indication that an operation similar to the one I performed had been previously performed on one section of the neck and a small section of the material had bene previously removed just as I removed it later.

(Article offered and received in evidence was marked DEFENDANT'S EXHIBIT 7.)

322 CROMWELL BOWEN, called as witness on behalf of the defendant, testified as follows:

My name is Cromwell Bowen. I reside at Wilmette, Illinois. My business is engineering with the Robert W. Hunt Company, located at 175 West Jackson Boulevard,

Insurance Exchange Building. The nature of their
265 business is consultation, inspection, testing. I have been identified with R. W. Hunt & Company approximately five and a half years. I have charge of the physical testing laboratory and such work as I feel capable of
323 performing that may come to the company. I graduated from the University of Illinois in 1923, with a degree of Bachelor of Science in Mechanical Engineering.

The work which I do at R. W. Hunt & Company's laboratory, of which there is a great quantity, is testing strength of a rather large variety of materials, as to its tensile strength, compressive strength, strength against impact and such as that; to perhaps a lesser extent, the determination or the making of a fairly wide variety of tests including such things as the testing for heat conductivity of various types of insulating materials. The work as a whole covers a wide variety.

Of the series of devices placed before me to examine and identify, this container marked "Aluminum Products Company sulphur bond" was one that was tested at our laboratory. I believe this was another; this was tested at our laboratory, and this marked "Aluminum Products Company old style jug, jug No. 2"; I believe
324 this was also tested at our laboratory, marked "Mantle Lamp Company of America jug No. 2," and this was tested at our laboratory, marked "Aluminum Prod-
266 ucts Company litharge bond." If the tags have not been removed this second device, was one that was tested at our laboratory marked "Aluminum Products Company, metal-to-crock jug." I am able to identify all of those as jugs I have seen before providing there have not been material changes in either tags or caps.

We received these particular jugs I have identified, last Monday. The instructions were to determine the matter of temperatures and temperature changes after filling them with hot water, those determinations to be made with reference to time, naturally.

325 I made those determinations and in making those determinations the jugs were placed in a room where there were very slight changes of temperature. That room, as I recall was quite close to 74 degrees during the time the tests were made. They were placed in this room and left there for a while until tests made by the use of thermocouples made of fine wires indicating that all of the parts

of the jugs were at the same temperature, both the inside of the crock and points on the outside. A thermocouple is a welded juncture of wires of two different compositions. In this case one side of each couple was copper and the other was constantin. In these tests the temperature was determined by the use of those thermocouples. The leads to the couples are connected to binding posts of a potentiometer, that is by the method we used. This potentiometer is so arranged that by the use of changing position of a rheostat or slide wire, or both, depending upon the magnitude, it will record the
326 267 millivolts set up as a potential difference due to the temperature at one point of the couple and the other point of the other contact, two couples being on each unit.

Explaining how these couples are associated with the potentiometer and what that particular instrument does: when the wire of the two different compositions—well the complete couple unit consists of two couples, one of which we keep at a low temperature—in the case of these tests at room temperature—and the other at the more elevated temperature at some point on the insulated jug, due to the difference in the chemical constitution of the two wires there is a potential difference set up which is measured by the potentiometer. The potentiometer is virtually the same as a Wheatstone bridge. It is a matter of setting up a counter force against that caused by the thermocouples and by a standard inside of this potentiometer unit that is set up to exactly balance it, the point of balance being determined by the non-movement of a galvanometer, and when standardized that will measure the E M F connected to the binding post of the potentio-
327 meter. The readings of the potentiometer are indicated on a slide wire which is calibrated with the instrument as it is originally made in such a way that the pointer in the slide wire shows the E M F in millivolts.

268 "Mr. Millar: Mr. Cromwell, if it will facilitate your examination I will admit that the potentiometer will accurately measure temperature. That will save all this preliminary examination.

Mr. Cromwell: I wanted to get it in the record, but if you will admit that is the most accurate—

Mr. Millar: It is accurate, I will admit it is accurate. There is no way to prove it is most accurate.

Mr. Cromwell: With the admission of counsel, your Honor, I will save time by using that."

For the measure of the temperature of a surface a thermometer is practically useless, whereas the thermocouple, preferably with a potentiometer, gives a fair degree of accuracy, depending largely upon how it is held and protected against the room air—against the surface,
328 the temperature of which is to be measured. As regards the comparative accuracy of a couple immersed in water against a thermometer immersed in water, that depends rather largely upon the thermometer itself.

Proceeding with my description of these tests to which I subjected these various articles, the jugs were placed in a room where there was very little temperature variation due to its being a moderately small room having only one window and one door, and that room has been used for similar purposes because we have discovered that its temperature does not change more than very slightly if the windows and doors are properly ad-
269 justed. Following that—after the various surfaces had come very close to room temperature, an amount of water was weighed out, practically equivalent to a gallon, 8.33 pounds, this being hot water. It was weighed in a glass container which was tempered by having hot water poured over it so that the water poured into it could be expected to be more nearly at the same temperature throughout, the temperature of this was measured by a chemical thermometer totally immersed, then was poured into one of these jugs; the cover plate was put in after a thermocouple was adjusted so that it would be expected to hang about in the center of the water in the jugs. Then the cover plate was put on and the cap
329 screwed over it, leaving the leads to that couple extending out through the holes, which you will see in all but one of the caps on these jugs here. Then the couples were applied at other points on the surface.

There were two series of tests. As to the particular points to which these couples were applied on each of these jugs, in the first series the one point was the center of the top of each jug. Another point was a quarter of an inch out from the cap. A third point was three inches up from the bottom of the side. In another series where the screwed cap was left off, the temperatures were measured upon the middle of the thread about the neck of the jug.

In order to measure a surface temperature with a thermocouple, it is necessary to prevent its cooling
270 down largely toward room temperature. If a couple were placed merely up snug against a hot surface,
271 that couple would register somewhere in between the temperature of the hot surface and the room temperature. To get a more accurate reading in this case, rubber bands were used such as are on some of these jugs at the present time, those function both to keep air at room temperature from circulating about
330 the point of the couple and also to hold the couple snugly up against the hotter surface.

Then at intervals, the time being recorded for each reading, determinations were made by means of these couples and the potentiometer of the temperature of the water inside of the jugs and at the various points I have described on the outside of the jugs. Inasmuch as every determination of that kind takes a certain length of time, they could not all be made perfectly simultaneously, but were made whenever it was possible to get a good reading and one that appeared to be free from error.

At the time I made these tests, all of the identifying tags, attached to the bail or bails of these jugs, except the one bearing "Aluminum Products Company sulphur bond," were attached when I received them; that was not attached at the time they were received.

At the time I made these tests the data that was revealed by the readings of the potentiometer through the different stages of the tests were recorded on tabulation
331 paper, the millivolt readings as against time, the time being measured either by my ordinary watch or a stop watch or a couple of stop watches, depending upon
272 the circumstances, my own watch being kept as a reference throughout all of the tests. Inasmuch as these could not all be run at the same time due to the need I considered of getting a fair number of readings, particularly in about the first hour after the introduction of the hot water, it was necessary to run them at slightly different periods or fairly different periods, and for the most part readings were taken on one jug alone at any particular time, except some of the readings later on which were taken at intervals of less frequency.

In computing the temperature in degrees based upon the millivolt readings of the potentiometer, all of the couples used were from a selected group of those we

made some time back and which checked by winding the couples in such a way that they would be in close contact with the glass about the mercury of rather accurate chemical thermometers which were placed in water and tried at various temperatures, and with a potentiometer we used we found that many of such tested in that way gave very close the same readings as are published in tables giving millivolt as against temperature for copper constantin in thermometers. Those that checked
332 closely were the only ones used for measuring the temperature of these jugs.

273 The first test was made on what I call jug No. 1 for the convenience in recording laboratory data, which is tagged "Aluminum Products Company litharge bonds." I can produce the running notes that I made at the time of these determinations. (Handing paper to counsel.)

Referring to sheet marked jug No. 1, page No. 1, there is recorded in the first column a heading of "time", in which the time in minutes from the complete introduction of the hot water into the jug was placed. In balancing the galvanometer of the potentiometer the readings were so made so that the balancing of the galvonometer was accomplished quite close to an even minute, primarily for convenience in recording the results and in making thereby something definite from such reading.

The second column on this data sheet is the room tem-
333 perature. This was noted from time to time at different parts of the room in the neighborhood of the jugs.

The next heading is labeled "inside." The zero minute was recorded at 74 degrees room temperature. Upon that is recorded the millivolt readings corresponding to the different periods of time recorded in the first column in minutes.

The following three columns on this are outside temperatures labeled "top", "near top", and "side". Those are the points I referred to some short time ago. Those also are the millivolt readings of the potentiometer,
274 all of them corresponding to a certain time in minutes following the complete introduction of the water into the jugs.

The same general arrangement was followed with regard to all the tests. Being in a great hurry and due to the fact that it takes time to obtain a good reading with a potentiometer, particularly at such comparatively low

temperatures as many of these are, the actual recording of the notes had to be done with haste. At the same time, of course, meaning that they had also to be done
334 very accurately because of the comparatively low temperatures measured. The time during which observations were made, was three hours for each jug.

After determining the temperatures through the action of the potentiometer, to translate the millivolt readings into actual degree readings the millivolt readings were plotted upon cross section paper and through the points so located these millivolts as one ordinate and time as the other ordinate, the curve was drawn through those for the purpose of recording in report form the result, and inasmuch as many of the readings were taken at odd intervals and would require a rather complicated report if each millivolt reading were directly interpreted into temperatures and recorded as against that time, for that purpose and also to afford a further check and to allow obtaining a better accuracy of comparative temperatures of the various jugs, that is, as I mentioned here, the millivolt readings against time were plotted
275 and at different more or less regular intervals,
335 which I believe were five, ten, twenty, forty, sixty minutes and one and two hours, points were taken from this curve, the millivolt at those time intervals noted, and the temperature corresponding to that millivolt page was recorded in our report. The purpose of that was to give data which would be a direct and comprehensive comparison.

The pages I have identified as my running notes indicate those translations as to temperature. In the original notes in each case the conversion to temperature at the various time intervals I mentioned, is down at the lower right hand corner of each sheet, for the various points.

The jugs on the first test, with respect to the arrangement and condition of the jugs and their physical assembly, were tested exactly as received except, of course, as I mentioned, the introduction of hot water and the necessary drilling of a small hole in the caps for the introduction of the thermocouples in such a way that it would check the performance of the jug in the least possible manner. These jugs were assembled with the caps
336 screwed on in the condition as they appear before me now. The actual purpose of the tests with the thermo-

couples applied to the center of the caps and one-quarter inch from the threads and three inches from the bottom of each jug, was to determine the temperature at those points.

Two of the three jugs tested in the second series, that are marked "Aluminum Products Company old
276 style jug, jug No. 2" and "Mantle Lamp Company of America jug No. 2", were tested with both the caps and the plug of the plate below the cap removed but with a piece of heat insulated material of blanket type placed over the opening and with a weight on top of that blanket insulation to hold it down snugly against the opening.

In the tests that were made with respect to the two last jugs I have referred to, the thermocouples were connected three inches above the bottom on the outside,
337 one-quarter inch from the cap on the top of the jug proper, and in the middle of the threads below the cap, of course, the cap being removed, as well as the water inside of the jug. In those tests, running notes were recorded in practically the same manner, as I have referred to in connection with the tests of the first series. I am able to produce the notes of the second test. They are in the same group that I just submitted to you. (Handing papers to counsel.)

Of the sheets I have just handed you, one marked No. 5 with the cap and plug and is paged No. 6. The others are marked No. 6, paged as No. 7. No. 6 was not one of the two just mentioned. That was the jug marked "sulphur bond" as it appears now. The sheet on the other made without application on the top of the jugs, is this record, page No 8 in the notes.

338 No. 6 was a jug that was received, I believe it was Tuesday night, and was subjected to tests in the same way as those tested in the first series. In
277 other words, tested with a cap and cover under the cap in the place they are ordinarily supposed to be.

When I received these jugs with the exception of the one bearing the tag marked "sulphur bond", there was the legend with respect to one of these jugs, "metal-to-crock bond"; with respect to another, "plaster of paris bond"; with respect to another, "litharge bond"; with respect to another "Mantle Lamp Company of America, Aladdin Industries, Incorporated, jug No. 2"; and with respect to another "Aluminum Products Company old

style jug, jug No. 2." I was not familiar with the form of the construction or material of the bonds that were present in these particular jugs at the time I made the tests.

339 There are pencil marks on the back of all tags, but this one marked "sulphur bond." Those are the numbers that were used for convenience in recording test data. I put those numbers on the tags. Those which wore tags are recorded on the last data sheet, giving the numbers which were used in recording the data and what markings there were on the tags. That which we called No. 6 has no tag and so it does not appear on this list. No. 6 is that which now bears the tag "Aluminum Products Company, sulphur bond." The jug which now bears the tag "sulphur bond" was called No. 6, at the time I had it, although at that time it did not bear the tag stating that it was sulphur bond. No. 6 was the number I applied to this particular jug for purposes of identification in my tests.

278 As to any change made with respect to the appli-
340 cation of the tags, the identifying tags, or interchanging of those tags with reference to those jugs so long as they were in my possession, while I was not present in the room with those jugs all the time they were in there, there is not the slightest reason for suspecting that anyone would be able to enter the laboratory and tamper with those or have any reason for doing so.

Q. Now, will you please take the data sheet which corresponds to the litharge bond, jug No. 1, and indicate, please, generally, the readings that appear on that sheet?

Mr. Millar: If the Court please, I am sure this is very interesting and instructive and we are building up a big record, but personally I don't see the materiality of it. I suggest that counsel be asked to show the materiality before we go any further.

The Court: What is the purpose?

Mr. Cromwell: I am comparing these bonds, your Honor, I am establishing the relative status of various bonds and bonding materials which have all been discussed in the record of this case.

Mr. Haight: What of it? One is a little better than the other. What of it? Incidentally, your Honor, it appears that these tests were made right here in this city last Monday. Counsel for the pleading are here and the plaintiff is here and we never heard of this before, there was no notice given, no invitation whatever.

341 279 Whatever they are going to say or do say will have very little weight with you, your Honor, under the authorities, as counsel on both sides very well know. If they are going to show one jug is a little better or a little worse than the other, what of it? Incidentally, we are taking a lot of time both from the standpoint of the weight of the evidence, no matter what it is, and also from the standpoint of apparently no material object to be gained without really interesting the Court or any of us.

Mr. Cromwell: If the Court please, I answer that proposition by referring to the record that was made in the examination of Mr. Johnson. There is entering into this question a very definite relationship of these bonds and the material used in these bonds in determining the question of infringement.

Mr. Haight: But you have bonds—

Mr. Cromwell: Pardon me, Mr. Haight.

The Court: You have gotten down to the point where you have got all your data identified here on these papers, have you not?

Mr. Cromwell: Yes, your Honor.

The Court: Are the papers understandable by the Court?

Mr. Cromwell: With the testimony of the witness to
342 guide the Court.

The Court: Then put them in.

Mr. Cromwell: This is a very essential—

280 The Court: Let's put the papers in. Go ahead.

Mr. Cromwell: I am going to put them in, but there is a phase of this I must still go into in order to give the Court a full knowledge of what we are going to argue and the basis of that argument.

The Court: Is it all directed toward the bonds?

Mr. Cromwell: Yes.

The Court: And whether or not the bond will carry—is a better conductor of heat than that?

Mr. Cromwell: That has its merits in the contentions. Your Honor will gather as you progress in connection with this case and its proofs, and especially when you come to determine it, that the real essential feature of this patent in suit, if there be any at all, resides in the bond itself.

Mr. Haight: Nonsense.

Mr. Cromwell: And not in the structural feature of this thing. I shall not take a great deal more time, but it is very important.

The Court: Well, we will recess at this time until 2:00 o'clock.

(Adjourned unto 2:00 o'clock P. M., October 27, 1933.)

343 The data sheets which I identified and referred to in connection with the jugs, the sheets in the second test are similar to the first test.

344 After I made these tests and made my determinations, I gave the final analysis of the tests in a
281 report tabulating the test data arrived at from these original data sheets which were turned over to you for awhile this morning. I am referring to the report based upon the data sheets that was all compiled into a report which was typed, taking the information from the data sheets. That report was turned over to your office. The document which you hand me is the original of the report referred to, of which there were carbon copies made. It bears my signature as a representative of the Robert W. Hunt Company. In compiling this re-
345 port, I recapitulated the readings and the facts that
282 I had developed in connection with my tests and which were expressed in my data sheets.

(Report marked as Defendant's Exhibit No. 8 for identification.)

Mr. Cromwell: I ask that the various jugs that were identified by the witness be marked for further identification as Defendant's Exhibit 8-A, this identification being applied to the jug bearing the tag which the witness has identified as No. 1; the jug which bears the identifying tag "Aluminum Products Company, metal-to-crock bond," being identified as Defendant's Exhibit No. 8-B; the jug bearing the identifying tag marked "Aluminum Products Company plaster of paris bond," Defendant's Exhibit 8-C; the jug bearing the identifying tag marked "Aluminum Products Company old style jug, jug No. 2", as defendant's Exhibit 8-D; the jug bearing the identifying tag marked "Mantle Lamp Company of America, Aladdin Industries, Incorporated, jug No. 2", as Defendant's Exhibit 8-E; and the jug bearing the tag, "Aluminum Products Company, sulphur bond", as De-
346 fendant's Exhibit 8-F.

(Which said articles were marked as requested.)

Referring to document marked for identification as Defendant's Exhibit No. 8, the meaning of the line on the first sheet of this report reading "Lab Sample No. 1,
2, 3, 4, 5, 6" means Laboratory Sample number, the
283 numbers being primarily used for the different samples for easy manipulation in the test room and convenience in keeping of results.

As to the significance of the wording, tag marking also appearing on the first page of this report and the six columns which appear beneath the number 1, 2, 3, 4, 5, and 6 those are the markings on the tags as we received them corresponding to the laboratory sample numbers used in recording the results.

As to the meaning of the first line on page 2 reading "Lab Sample No. 1, 2, 3, 6, 4, 5 that refers to the same numbers, the test data of the sample identified by that number and on the first page with the tag markings appearing in tabulated form below those laboratory sample numbers.

347 The boxed figures appearing on page 2 under the respective headings, "water temp — Deg. F," "temp at center of cap— Deg. F," "temp ¼ inch from cap—Deg. F," "temp on side 3 inches above bottom—Deg. F," are the readings at various times during the tests on each of the samples. On the left hand side of that page appears time in minutes, zero minutes being the start of the tests at the time the hot water was introduced into the jugs as mentioned this morning, and the various groups that you read off are the temperatures at the points thus described in degrees Fahrenheit corresponding to the time shown in the left hand column.

As to the vertical column of figures appearing un-
284 der the numbers 1, 2, 3, 6, 4, 5, each vertical column from top to bottom of the page under those various laboratory sample numbers refers to data on the samples identified by that number.

Respecting the boxed figures on page 3 of the report, and whether or not the facts which I have referred to as the explanation of the figures on page 2 apply to the figures on page 3, the explanation is practically the same
348 as on page 2, with one exception, that these tests being made without the caps no temperature reading of any significance could be made there, but instead the temperature was measured in the center of the thread which

the cap screws over in place of that on the top of the cap. Otherwise the significance of the figures and arrangement is the same as on page 2.

At the time I made these tests no one was in attendance other than officials of Robert A. Hunt Company. Most of the time I was alone.

349 *Cross-Examination by Mr. Millar.*

The first I heard of taking any tests for Mr. Cromwell I believe was last Saturday; it might have been Friday, but I believe it was Saturday. I talked to Mr. Cromwell
350 over the telephone. The arrangements for taking these tests were made with me directly by Mr. Cromwell.
285 Mr. Cromwell brought the jugs to me accompanied by two men, whose names appear on our test report, Exhibit 8. They came with Mr. Cromwell and I
286 received my directions from him, as to the tests to be made. I know that heat is a very elusive thing and everything has a tendency to equalize itself.

After the hot water had been inserted in any of these jars, the caps were not removed until the completion of the tests.

351 The cap was not off this jar at all during the test after being replaced on the jar after putting in the hot water. As to how long the hot water was in there before the cap was put on, I cannot say definitely. It was a very short time, however, inasmuch as the motions for the start of each test were very much the same and inasmuch as I went through those necessary motions all myself, I believe that each test was started in a manner close enough to each of the others that the test results would not be affected by such variation, which I believe to be quite small. I made no calculation, however, with respect to the length of time between pouring the hot water into the various containers until I placed the caps on them.

352 I do not know what sealing materials were used in the different exhibits around the necks, between the neck of the jacket and the neck of the container before I made the tests, and did not know. I made no examination of these various jars prior to the tests I made, further than merely superficial visual examination.

287 I do not know the relative weights of the various

vitreous containers in each of these jars. As an absolute determination I did not measure the specific heat or the heat holding capacities of the inner containers of the different exhibits tested. I do not know whether or not the holding capacities of the various inner containers are identical.

The heat conductivity of comminuted material in the
353 different exhibits, the material between the wall of the jacket and the wall of the container, I did not test directly. I don't even know there is any in there, except as I have been told.

I do not know the thickness in any of these containers between the inner wall of the outer jacket and the outer wall of the container. I do not know how much material is in there. I know that it is a fact that a heavy body of the same material will absorb and hold more heat than a lighter body of the same material, so that if the inner container of one of these jars is twice as heavy as the inner container in one of the others, the heavier one will absorb and hold more heat, and it is a fact that in a container of this type more heat will be dissipated from a thick neck than from a thin one, all other conditions
354 being equal. It is a fact that a heavy body of the same material will hold heat longer than a light body of the same material, light in weight, the heat loss being the same for both sides, yes, the rate of heat loss.

288 Mr. Haight: I would like to ask counsel for the defendant if he will stipulate on the record in respect to these alleged tests that the plaintiff and no representative of the plaintiff was asked to be present and that we have no knowledge of it.

Mr. Cromwell: Absolutely, your Honor.

MARTIN D. BECKER, called as a witness on behalf of defendant, testified as follows:

Direct Examination by Mr. Cromwell.

My name is Martin D. Becker, I live at Lemont, Illinois. I am employed by the Aluminum Products Com-
355 pany, in their plant located at Lemont, Illinois. At their plant they make cooking utensils and various other things; also manufacturing jugs concerning which this

litigation is involved. I have been with the Aluminum Products Company off and on since 1913. I think I left them the last time about 1922 and went back in 1931. In that interval I was in business for myself in the tool and die business in Chicago here, making tools and dies for different concerns.

I can identify the jugs before me marked for identification Defendant's Exhibits 8-A to 8-F, inclusive. The
289 jugs with the green painted bases are manufactured
356 by the Aluminum Products Company. The jug which is apparently wholly of aluminum is one of the first jugs the Aluminum Products Company manufactured.

I recognize the dark one standing second in the tier there. According to the label on it, it is made by the Aladdin Manufacturing Company. To my best knowledge the first time I saw one of them that I paid any attention to, was last Sunday.

I had something to do with the construction of the Aluminum Products Company jugs which are before me. I made up three of the jugs for the purpose of sending them to your office. One of them was made up with litharge and glycerine, the other one was made up just the jug to the crock, metal-to-the-crock. The other was made up of plaster of paris under my supervision. As to the delivery of these jugs to your office, I know they left the
357 factory last Saturday for delivery to your office on Saturday, but I understand they didn't get there until Sunday. I first saw these jugs in your office last Saturday.

Q. I call your attention to Defendant's Exhibits 8-A, 8-B and 8-C. State whether or not you have any means of identifying these jugs ——

A. Not any further than ——

290 Q. Wait a minute—as the jugs which were made to include the materials you have just referred to.

A. The tags on them, I saw you attach the tags to them, and if they haven't been removed there is where they ought to be.

After I saw these jugs in your office on Sunday last, I have further knowledge of the history of these
291 jugs as to where they went. Monday we took them over to Hunt & Company, and then from there we went with the two jugs to the Miner Laboratories, you and I. The particular jugs I took to the Hunt Company

were five jugs that are identified here. The only one
358 that we didn't take, when I was with you, was one with sulphur. That was our regular jug. That was sent over afterwards. The three Aluminum Products Company jugs that were delivered to the Hunt Company I brought them up to the court here, day before yesterday, from Hunt & Company. Mr. McManus helped me bring them over.

In the construction of these jugs with the materials which were plaster of paris, and litharge, and likewise the jug which had the metal against the earthenware con-
359 tainer, the litharge was put in under my supervision, as was the plaster of paris, and the top was spun to the crock under my supervision. That was done at the Aluminum Products Company in Lemont, Illinois.

When I made these jugs with those materials, nobody told me where to put them, those materials. I knew where to put them. My own knowledge told me to put them just where I did put them. I put the litharge in the aluminum top, and then put it on a fixture we have there, and then from that I put the jug into the litharge and let it rest there until it got hard. I put the litharge in there to suspend the jug from the top. Putting the plaster of paris in that particular jug where the
292 plaster of paris is, was for the same purpose. Making the jug so the metal of the top was in contact
360 with the crock, was for exactly the same purpose.

Defendant's Exhibit marked for identification 8-F, that jug is one of our regular jugs. In that regular jug the material that I put into the top between the earthenware crock and the neck of the metal top, was sulphur.

My reason for going to the offices of the Miner Laboratories was that you asked me to go along with you and take the jugs over. You were going to have a test made on them. I took the jugs that were cut over here before that Mr. Miner had; I took that jug and this jug right here.

Defendant's Exhibit 7 seems like the same jug I took over to Mr. Miner. I identify it because it was partly cut open as it is now and I happened to do that job my-
361 self. Before it was delivered to Mr. Miner I had cut open this jug. As to where I cut it open, I cut it open at the Aluminum Products Company. As to what part of the jug I cut open, I cut open the top here, only I

didn't have it exposed as much as it is now. I did that because I was instructed to cut it open and I done it. To cut it open I used a fine toothed hacksaw blade. I removed from the metal neck at the time I opened it a piece about two and a quarter inches. I removed some of the substance that was in between the jug and
293 the outer part. When I delivered that to Mr. Miner there was no change in the form of the jug before
294 me other than having the piece which I say was removed away from it.

362 When I delivered that to Mr. Miner the position of the material between the neck of the outer jacket and the neck of the inner container was practically the same as when it come from the store outside of the piece I cut out of there. I haven't seen that jug since the time I delivered it to Mr. Miner, until I saw it in here this morning.

Cross-Examination by Mr. Millar.

I made the three containers that are marked. I couldn't tell you the three I made without referring to
363 the tags on them. I marked them at the time I made them. They are marked on the jug on the inside with a lead pencil written in them, on the outside of the inside jug. In there some place on the inside. After I put the bottom on, I did not mark them. One of them had a plaster of paris material between the neck of the container and the neck of the jacket. Another has litharge, and another is directly connected metal to the crock, and marks I made are some place on the side, but not now visible to the eye. I did not put any other mark on it after that. I can't pick out for you now, without reference to these tags, which one has litharge in it. I cannot pick out which one has plaster of paris without
364 referring to the tags. I cannot pick out the other one either, but can open them up and show it to you.

295 I am regularly engaged in making these jars, insofar as my part of the job. I am a master mechanic. I have occasion to come in contact with a number of these crocks similar to the inside of this jar. They vary. As to thickness I couldn't say offhand. I imagine they do in thousandths of an inch, maybe. I presume there is a slight difference in weight. I never weighed

any of them. I did not weigh any of these that I put in these containers that I manufactured.

365 In defendant's Exhibit 7 for identification, the neck has been roughened up since I delivered it to Mr. Miner; that has been cut open further, cut away and then back.

Redirect Examination by Mr. Cromwell.

When I made these jugs I got the inner containers out of the pile we have in the factory, the regular stock pile we use in making them up.

(Witness withdrawn.)

367 FRANK L. SESSIONS, recalled as witness in behalf of the defendant, testified further as follows:

Direct Examination by Mr. Cromwell.

I have been previously sworn in this case. I understand Defendant's Exhibit 8 marked for identification.

296

368 This report is a tabulation of the results of observations made by research engineers of Robert W. Hunt Company on six different heat insulated receptacles to determine the temperatures of different parts of the outer surface of the receptacles, that is of the jackets and of the contained water in them at regular predetermined times from the beginning of the test.

As Mr. Bowen has stated, each jug in each test was filled with a gallon of water at 150 degrees temperature. Then the observations were made throughout a period of three hours and five of the tests throughout a period of forty minutes. I should say throughout a period of three hours in five series of the tests; throughout a period of forty minutes in three series of tests.

I have compared these readings with a particular end in view, that end being to determine, if possible, the insulating efficiency or effect of the bond or filler between the neck of the inner container and the jacket. From my study of these tabulated temperatures, I can find little, if any, indication that the bonding material or filler material between the necks of the inner containers and

369 the jackets has any material effect upon the over-all effi-

ciency of the jackets. For instance, in the test of the water temperature in degrees Fahrenheit of the jugs of sample numbers 1, 2, 3, 6, 4, and 5, shown on page 2 of the tabulated results of the test, at the end of forty minutes the first four jugs in the test, numbers 1, 2, 3, and 6, had a water temperature of 137, 136, 135, and 136
degrees, respectively. No. 4 had a water tempera-
297 ture of 137; No. 5 had a water temperature of 138.

At the end of three hours, Nos. 1, 2, and 3 had water temperatures of 121½, 122, and 119, and Nos. 4 and 5 had water temperatures of 123½ and 130 degrees, respectively.

Now, if you refer to the first page of the report in which the receptacles are identified by the same numbers, you find that sample No. 1 was an Aluminum Products Company jug with a litharge bond, sample No. 2 was an Aluminum Products Company jug with no bond, the metal being pressed against the neck of the inner container, and it is designated in this on page 1 as metal-to-crock bond. Sample No. 3 was an Aluminum Products Company jug with plaster of paris bond.

Comparing these water temperatures at the end of three hours of these three jugs, it is found that the No. 2, which had no filler or bond between the metal of the
370 neck and the neck of the inner container, had a temperature of 122 degrees, which is higher than the temperature of No. 1 sample, which had a litharge bond, or No. 3 sample, that had a plaster of paris bond.

The No. 4 jug, which on the first page is stated to be an Aluminum Products Company old style jug, had a water temperature of 123½ degrees after three hours, and the No. 5 jug, which is listed on the first page of the report as Mantle Lamp Company, Aladdin Industries, Inc., jug No. 2, had a water temperature of 130
degrees. The No. 6 jug of the Aladdin Industries,
298 Inc., was a different appearing jug and apparently of different proportions. It shows in this test that it had a superior over-all efficiency, that after three hours the water temperature was 130 degrees, whereas the highest temperature of the Aluminum Products Company jugs was 123½ degrees after the same time, that being the No. 4 jug, which is listed as old style jug of the Aluminum Products Company.

So there is very little indication, if any, that the differ-

ences in the bonds between jugs of samples Nos. 1, 2, 3, 4, and 6, so far as the readings went to forty minutes, very little indication, if any, that there was any difference in the over-all efficiency of these jugs occasioned by the differences in the bonds. If, in fact, the bonds such
371 as litharge, plaster of paris, were better heat insulators than the connection of the crock direct to the metal, then the Nos. 1 and 3 tests of these water temperatures after three hours should have shown higher than the No. 2, which is a test of a jug without any filler or bonding material between the metal neck and the neck of the inner container.

372 The last page of the report, page 3, shows the results of observations of temperatures of jugs without covers, and each jug covered with a piece of heat insulating material, the material being rested upon the top of the jug opening and held snugly in place with a weight. The two jugs compared are numbers 4 and 5; the number 4 being the Aluminum Products Company old style
299 jug, jug Number 2, and the number 5 being the Mantle Lamp Company's (Aladdin Industries, Inc.) jug number 2.

At the end of forty minutes the water temperature of the Aluminum Products Company jug, sample No. 4, was 139 degrees, and that of the Mantle Lamp Company's jug, sample No. 5, 140 degrees. It will be noted that these temperatures, if compared with those given on page 2, are a little higher than the temperatures of the water in the same jugs, when tested with the caps in place.

With the caps in place, the temperature of the water in number 4 sample of the Aluminum Products Company was 137 degrees as compared with 139 degrees in the test shown on page 3 in which the cap was removed and an insulating material pad placed on top of the jug.

Similarly the Mantle Lamp Company's jug, sample No. 5, showed that the temperature of the water after 40 minutes with the cap on was 138, and with the cap removed as shown on page 3, after 40 minutes, 140 de-
373 grees. If all other things were equal, this would indicate that the cap is a better dissipater of heat than the felt or insulating pad that was placed on top of the jugs after the cap was removed, the felt being in place in the test found on page 3, the caps being in place in the test found on page 2.

There is nothing in these comparisons to indicate that the material of the bond used in samples numbers 4 and 5 materially affected the over-all efficiency of the jug.

300 There is another set of readings that are comparable as between the tests shown on page 2 and those on page 3. I refer to the temperatures taken a quarter inch from the cap upon the cover. That position being a quarter of an inch from the bottom edge of the cap. Observing the figures in the columns under this caption on page 2 for samples numbers 4 and 5, it will be seen that sample Number 4, which is the Aluminum Products Company jug, started off with a temperature of 74 degrees at the point which was a quarter of an inch from the cap. After five minutes it was 81½ degrees; after ten minutes 89 degrees; after 20 minutes 96 degrees; and after 40 minutes 100 degrees. Whereas, with the cap removed and a pad of insulating material

374 substituted, these temperatures went up, after five minutes 83 degrees, which is 1½ degrees hotter than with the cap on; after ten minutes 91 degrees, which is two degrees hotter than with the cap on; after 20 minutes 99½ degrees, which is 3½ degrees hotter than with the cap on; after 40 minutes 102 degrees, which is 2 degrees hotter than with the cap on.

Comparing the readings taken of the Mantle Lamp Company's jug, sample No. 5, at a point a quarter of an inch from the cap as shown on page 2 of the report, the temperature at this point started out at 74 degrees, rose to 78 at the end of five minutes, 81½ degrees ten minutes, 87½ degrees 20 minutes, and 90½ degrees at 40 minutes. At the same periods of time with the cap removed and a pad of insulating material substituted,

301 the readings which are found on page 3 for this same jug are, at the start, 74 degrees, after five minutes 81 degrees, which is 3 degrees hotter than with the cap on; after ten minutes 88 degrees, which is 6½ degrees hotter than with the cap on; after 20 minutes 94 degrees, which is 6½ degrees hotter than with the cap on; and after 40 minutes 97 degrees, which is 6½ degrees hotter than with the cap on.

There is only one conclusion that appears to be defi-

375 nite from this comparison, and that is that the radiating efficiency, not the heat insulating efficiency, but the capacity to radiate the heat of the Mantle Lamp Com-

pany's cap is greater than is the capacity to radiate heat of the Aluminum Products Company cap.

I draw this from the fact that the Mantle Lamp Company's jug a quarter of an inch from the cap rose to a higher temperature, its temperature increased more with the cap off and an insulated pad on top than did the Aluminum Product Company's jug with its cap off and a pad of insulating material placed there.

The temperature of this Aladdin or Mantle Lamp Company's jug rose higher with the insulating pad on than did that of the Aluminum Products Company, showing that when the cap was on it had more effect in dissipating the heat of the Mantle Lamp Company's jug than did the cap of the Aluminum Products Company
302 when it was on. There is heat being conducted from the water inside through every possible bit of material there is between the inside and the outside. That
376 heat is finally imparted to the air, dissipated. When the cap is on there is a very considerable amount of heat that rises from the vapor and also is conducted to it from the metal of the casing, a very considerable part of the heat is dissipated from this top, the cap.

Now, if we take that cap off we find that this part of the cover a quarter of an inch away from the cap becomes hotter with the cap off than it was with the cap on, and it is, I believe, a correct deduction that the reason why this is hotter is because the heat cannot get away from there, it is not conducted away or radiated away from that point as fast as it is when the cap is on. I might say that might be due to better contact of the threads of the Mantle Lamp Company's cap, or it may be due to a difference in the thickness of the metal of The Mantle Lamp Company's cap as compared to the fit of the threads and the thickness of the metal in the Aluminum Products Company's cap.

My statements just made have been based entirely upon the relative figures pertaining to the two jugs. Based upon the report I have discussed I deduce that the value of the bond or the tie between the neck of the container, or the jacket, and the earthenware crock, in
377 so far as a heat insulating element is concerned,
303 is practically nil.

MARTIN O. BECKER, a witness on behalf of defendant, having been previously duly sworn, testified further as follows:

Redirect Examination by Mr. Cromwell.

I have opened the jugs marked for identification Defendant's Exhibits numbers 1, 2, 3 and 4. I opened them with respect to the filling material between the crock and the outer jacket so I could tell what they were without looking at the tag.

In the case of the one marked Defendant's Exhibit 1, I
378 recognize the filler to be litharge. In the case of Defendant's Exhibit 2, that is the metal to the crock. With respect to the one marked Defendant's Exhibit No. 3, that is the plaster of paris. The filler of Exhibit 8-F is sulphur.

NORRIS F. MURRAY, a witness on behalf of the defendant, having been previously sworn, testified further as follows:

I have been previously sworn in this case. The specimen of Zonolite filling, which I testified to as being incorporated in the commercial structures of the Alumi-
379 num Product Company's jugs, was taken from the
304 assembly bin at the Lamont plant this morning.

That is characteristic of the Zonolite that we put in all of our jugs, since we commenced to manufacture jugs with that as a filler. For a short period of time we used a finer ground, or rather a finer screen than this particular filler. We found this cheaper, and have been using this continuously, I would say 90% of all our purchases have been of this type. You understand you can buy any screen you want to, fine or very coarse.

(Specimen of the Zonolite product offered and received in evidence, marked DEFENDANT'S EXHIBIT 9.)

Mr. Cromwell: I ask opposing Counsel if they are
380 willing to stipulate Defendant's Exhibit 8-F as the jug of the Aladdin Company?

Mr. Millar: I admit that particular jug is manufactured by the Mantle Lamp Company.

Mr. Cromwell: I offer in evidence the several jugs designated as DEFENDANT'S EXHIBITS 8-A to 8-F inclusive.

Mr. Millar: We object to them, if the Court please, because of their lack of materiality. We do not yet see the materiality of all of this evidence that has been introduced.

The Court: Objection overruled. They may be received.

(Which said devices, so offered and received in evidence, were marked DEFENDANT'S EXHIBITS 8-A to 8-F, inclusive.)

305 (Report of witness Bowen, offered and received in evidence, was marked DEFENDANT'S EXHIBIT 8.)

381 Under an omnibus offer, all exhibits of the defendant under their original markings, were offered and received in evidence, with no objections except those heretofore made.

Defendant rested its case.

382 EVIDENCE IN REBUTTAL.

PEARL H. BRAINARD, a witness on behalf of Plaintiff, recalled in rebuttal, having been previously sworn, testified as follows:

Direct Examination by Mr. Millar.

I have been previously sworn in this case and am the same Mr. Brainard who previously testified. With reference to the time when the Macomb Manufacturing Company began the manufacture and sale of heat insulated receptacles, I had at that time seen a heat insulated receptacle of the type in suit.

Cross-Examination by Mr. Cromwell.

I purchased one at a local store.

383 306 HARRY N. LOW, called as a witness on behalf of plaintiff, in rebuttal, having been first duly sworn, testified as follows:

My name is Harry N. Low. I live at 2933 Tilden Street, Washington, D. C. My business or occupation is solicitor of patents and expert in patent cases. I have been studying patents carefully and continuously for the past fifty years and more. For probably the past twenty years I have been giving evidence from time to time in patent causes. I have testified in most of the circuits of the United States, and several times in this circuit.

Referring to the patent to Fox, No. 438149, I have
384 studied that patent carefully and am familiar with it and understand it. I understand the purpose of that device to prevent conflagrations arising from the spilling or breaking of a carboy of strong acid. The prevention means are the devices that prevent the breaking of the carboy, principally. I could not give dimensions of the carboys in commercial use very accurately, but I know they are very sizable, larger than one of these large water bottles that they have on stands and very heavy. I know that acids are much heavier than water.

385 Again referring to the Fox patent, I do not find any suspension of the carboy described or indicated in this patent. The carboy rests on the bottom of the case, and on account of its great weight it must so be supported. It could not be supported by any suspension shown in this patent.

307 B in either figs. 1 or 2 is made of Plaster of paris. Its real function is to center the carboy in an upright position and resting on the base of the case. That is to say, it is to keep it in the middle of the case and keep it from tipping to one side or the other.

Element B is so constructed that its function is just the contrary to a bond. It braces the neck of the bottle away from the edges of the aperture in the top of the case. I find no interlocking means of the element B with the jacket or with the neck of the carboy. It is simply in contact with those parts.

386 If the bottom of the box were removed and the box lifted, considering the weight of the carboy, in my opinion the box and the plaster would come up together in

the hands of the person making the lift, or possibly the box would separate from the plaster and leave that on the neck of the carboy.

I have a little experience with the characteristics of plaster of paris with respect to its adhesive qualities and I have knowledge I obtained possibly by reading that it requires an interlock to keep it in place ordinarily, or something very rough to cling to. It is largely used for filling up little apertures in various places, and of course there, if the walls of the aperture in which it is pushed are rough, it obtains some interlock. Plaster of paris soaks up water very readily.

I do not find any disclosure in the Fox patent indicating that the material C is interposed for the purpose of heat insulation. All the parts shown in this patent
308 are supposed to be at atmospheric temperature.
387 There is no heat within to be conserved or absence of heat in the package to be maintained. There is a statement in the patent with reference to freezing, where it gives the reason for using the mineral wool, and freezing is contemplated, there is nothing in the patent to prevent freezing, but the mineral wool is used so that in case of freezing, damage will not be effected. I judge that the mineral wool is used primarily to prevent the arising of a conflagration from the spilling of the acid, and I believe that the inventor had in view the incombustibility of plaster of paris in using that for a filler or brace at the top of the case, because in a spilling of acid, if it were caught on this plaster it would not cause combustion, plaster of paris being incombustible.

Referring to the Clisbee patent, No. 358732, I have studied this patent and understand it. As to any insulation between the wall of the outer can and the wall of the inner can, the description in the patent is that these
388 inside and outside elements which you have mentioned "meet", indicating nothing further than that they touch each other. These two elements touch each other and leave no room between them for a bond, and on their upper ends or edges they are contacted by the horizontal flange of a ring, so that there is no place for the application of a bond.

309 The inner can is constructed of sheet metal which is a good conductor of heat. In my opinion the Clisbee can is an inefficient receptable for the conservation of heat.

On the first page, beginning with line 9, where I find these words:

"The object of this invention is to furnish an improved insulated can for coffee and other beverages packed in its body and top to resist radiation so that the liquid may retain its heat for 24 hours or more;"
389 it seems an excessive statement to me. Of course, heat will be retained longer by a large body than by a small body. This can, however, supposing it to be a five gallon can, I do not believe that it would, in my opinion it would not, contain high heat for 24 hours. The coffee would become warm, but it would not remain hot.

The element "o" in fig. 1 and fig. 3 is a faucet for drawing off the coffee out of the can and, with respect to the retention of heat in the contents of the container, this faucet extends from the inner container through the insulating material C and through the outer jacket and is necessarily in intimate contact or connection with the container and with the jacket. Now, the faucet in itself, unless it should be of wood, would be a very good conductor of heat, and would rapidly take up heat from the inner metal or container, and would rapidly conduct
390 it to the outer jacket, and this heat would very easily
310 throw in a way all through from one atom to another of the steel and be radiated from all parts of the outer jacket, and would be so radiated.

I am familiar with many old and known ways of joining metal to metal, brazing, soldering, crimping, with sheet metal, sometimes called double-seaming the metal, one-piece of metal to another.

There is no disclosure in the Clisbee patent of means which could be employed to unite a metal jacket of a container to a frangible vitreous container.

Referring to the patent to Heath, No. 211092, I have studied this patent carefully and understand it. The specification discloses that the purpose for which the invention was made, is an encased bottle for transporting
391 fluids. The only object mentioned, so far as I see, being to prevent the breakage of the receptacle. This is another of these devices in which everything is supposed to be at atmospheric temperature and, as I said in the case of the Fox patent, there is nothing within to be kept hot or to be kept cold by this or that means of the conduction or radiation of heat.

There is nothing in the specification or claims that in-

dicate the inventor intended that as a heat insulated receptacle. There is, however, a double case and there is a packing illustrated. That packing is intended to prevent the breaking of the bottle. I do not find any bond between the jacket and the container at any point. I
311 do not find any seal between the jacket and the container at any point. I do not find any place in the Heath patent where a bond or seal could be interposed between the necks of the jacket and the container without removing some of the material that is now there. It is difficult to see how a bond could be applied in this
392 structure so as to operate efficiently between the neck of the bottle and the top part of the jacket.

I began the study of drawings and patents in 1879. I had been familiar with drawings and machinery generally before that time. I was familiar with the patent office rulings with respect to drawings at the end of the year 1879.

An examination of fig. 1 in the Heath patent, as to whether or not there is a disclosure there indicating that the container rests on the neck of the jacket, the disclo-
393 sure of the drawing is according to rules of drawing known to the Patent Office and to draftsmen generally that the extreme top of the jacket is not in contact with the underside of the flange of the container. It has been the rule of the Patent Office as long as I can remember, to be treasured up in the heart or the mind of every draftsman, that the light comes from the upper lefthand corner of the drawing he is making. Now, that is not quite comprehensible at first thought to everybody, but it means, as a result of that prescription, that you are to make your heavy lines on the righthand side of the object you are delineating, and your thin or fine lines
312 on the lefthand side of it; and you are to make your thin and fine lines on the top of it, and you are to make your heavy lines on the bottom of it. That is to say, the theory of these heavy lines is that they represent shadows. Now, when you delineate an object in contact with another one, you put in a thin line separating those objects. If this is in contact with that piece of wood below it, and the upper one projects a little, there you would not draw a thin line between those parts, because you have got that shadow, this upper piece is projecting forward, and you put your heavy line in there.

394 Now, applying these principles to this drawing I would say that the line at the underside of the flange of the container would be a thin line if the top of the jacket was intended to be shown in contact with the underside of the flange. However, I see a heavy line there, therefore, my inference is and information is that those parts do not contact.

I saw this drawing, Plaintiff's Exhibit 16 for identification, yesterday evening. That illustrates the explanation I have just been making. Drawing A indicates the disclosure made by Heath. B indicates that the top of the jacket is in contact with the underside of the flange, and it is my understanding that if the drawing in Heath were similar to B, that then the patent drawing would indicate that the container rested on the neck of the jacket.

395 I may illustrate further. If you want to measure the vertical dimension of this flange of the container, you must measure from the top fine line down to the top 313 of the bottom heavy line, not to the bottom of the heavy line, or else you would be measuring a shadow in addition to measuring the thickess you want. And so if you measure the length of the neck of the jacket upward, you must not take in the heavy line that defines a shadow on the bottom side of the flange. You must measure up to the bottom of that line, as the distance between that shadow, the thickness of that line, between the top of the extension of the jacket and the bottom of the flange of the container. This, however, is of course reinforced, that is to say, the drawing and specifications agree, in the specification mentioning the flange of the container, without any statement that they are in contact and in fact saying that the container used not have any flange.

Now, the specification could not be so written if there were any contemplation of the container being suspended on the jacket.

In my opinion the bottle is then sustained within that casing by resting on the packing in the bottom of the jacket. The description about that is somewhat suggestive in this respect. It says, near the top of page 2 of the patent: "The metal bottom is inserted", that is to say after putting in the fine cork chips," and is pressed down on the packing."

396

Now, you have got a packing under pressure beneath that bottle, and that certainly tends to force the bottle

upward. There is no necessity for its being hung from
or resting on anything except the packing of the bot-
314 tle. The specification, with reference to the lip of
the bottle, used the word "flange" at some place.
Near the bottom of the second column of the first page of the specification it says that the top of the neck "b" is pressed inwardly so as to close firmly around the neck of the bottle, "which may be flanged as shown."

In the Heath device had the screw-threaded cap been removed and the device inverted, so that it is upside
397 down, the container would become immovable in the jacket, except possibly a slight sliding, of the parts, what would be normally the top of the jacket, supposing that the packing is not quite so dense on the top of the bottle as it is under the bottle, there would be left a very small space in which the glass container might settle toward the normal top of the jacket.

Comparing the bond in the Blair patent and the plaster of paris plug of the Fox patent, I fill first say that I have read and understand the Blair patent. It has a bond of low conductivity, and of such material, such substance, as will adhere to the outside of the neck of the container and to the inside of the neck of the jacket. The bond is located at this point, and holds the top of the bottle fixedly at that place. By this means there need be no support for the bottom part of the bottle, and the bottle can have a sidewise yielding motion; the inventor not having
any word exactly to describe this, used the words
315 "pendant" and "pendulous." Well, the dictionary
won't help there, and the best way, in case of a word, the intent of which is not quite understood, and which may not apply literally, is to examine the inventor's
398 specifications. There you get his thought and you will see what, for instance, "pendulous" meant to him when this specification was signed by him. The word "pendulous" is at the beginning on the 32nd line on page 2 of the Blair patent. I believe in other places in the patent the word "pendent" is used. Now, the meaning is simply and very plainly this, when you consider the drawing and the other part of the specifications: that the top part of the container is held immovable, and the bottom part of the container is left free, so that it can have slight movement from side to side.

Now, it is not intended that that shall be any great

movement, and if it is set up by any shock the inventor wants to stop that movement and bring the container to rest again, therefore, the container is braced, as it were, at its sides by cork filling. The movement of the container that I have described is brought to rest again by the cork filling, but by having the movement the vessel greatly protects itself against fracture at the necks. That is set forth in the Blair specification.

Now, that can happen, it can be well sustained that way on account of the quite considerable circumference of the neck, so that all this support by a bond and this holding
399 is distributed, very much distributed, and the force is
316 so distributed that a small part of it comes upon any one place in the glass container; I mean a disrupting force coming from sidewise, or other shock.

Now, in the fox patent there is no suspension, there is not the slightest idea of that container having a little sidewise movement so as to relieve itself from fracture. It is held practically immovable. It does not seem to be capable of any motion, except it might slide slightly on the base of the box, and if it did, it would have to kind of tip up a little bit, its top being centered by the plaster of paris brace. Now, there being no suspension there, there being no bond from which the container can hang, it rests solidly on the bottom of the box, I do not see any similarity between the two structures that you have asked me to compare.

Mr. Millar: I offer this drawing in evidence as PLAINTIFF'S EXHIBIT 16.

Mr. Cromwell: Objected to as immaterial and irrelevant, and as further effort to distort the disclosure of the drawing of this particular patent.

400 The Court: Q. Suppose that metal container did not come up there to the glass, and you screwed the top down on its firmly, wouldn't that have a tendency to pull the glass up?

A. Oh, the outer screw cap, you screw that down.

Q. Tightly?

A. That presses down on the top of the cap, and it presses the bottle down.

317 Q. Presses the bottle down. Wouldn't that hold the bottle up in the metal container?

A. It would have that effect.

Q. Do you think that was intended?

A. I don't think it was. At least there is no descrip-

tion of it. I cannot say whether that was intended or not.

Q. That would be prevented if the metal came right up to the glass, wouldn't it?

A. Yes.

Q. What?

A. It would.

The Court: It may be received.

(Document so offered and received in evidence was marked PLAINTIFF'S EXHIBIT 16.)

401 318 *Cross-Examination by Mr. Cromwell.*

Patent Office drawings do not have the dimensions marked on them, but most of them are dimensional, although on a small scale.

Q. I am talking about the representation of the structures delineated by the drawing of a patent. Now, those drawings are not such drawings as you build from in making a device, are they?

A. I take into account the difference in size, the scale, you understand. Now, take the case of the drawing of Heath, he sends that device to his patent solicitor to file an application, the solicitor's draftsman will certainly measure that device that is sent to him very conscientiously, and lay it down on paper.

I know what a working drawing is. A Patent Office drawing is not a working drawing in the sense that term is employed, it is too small in most cases. A patent office
402 drawing is only supposed to be illustrative of the parts it represents. When inventors, patentees—go to construct their devices for commercial use, they usually employ a regular mechanical draftsman to prepare the drawings for that purpose.

I have never tested the coffee can of the Clisbee patent. I don't know that I have testified to its lack of utility in any respect. I did doubt the length of time
319 that it would keep the coffee hot. I did doubt its efficiency. I thought the coffee would be warm at the end of this 24 hours, but not hot. A very large amount of coffee might, of course, be hotter. My criticism of the Clisbee patent, is the question of its efficiency as to a nonconductor of heat.

(Adjournment to Monday, October 30, 1933.)

404 320 Mr. Cromwell: If the Court please, in introducing my documentary exhibits I inadvertently omitted the usual file wrapper of the patent in suit. I ask leave, to introduce that at this time.

Mr. Millar: No objection.

The Court: Let it be received.

(Which said document, offered and received in evidence was marked DEFENDANT'S EXHIBIT 10.)

405 ALLEN D. WHIPPLE, called as a witness in behalf of plaintiff in rebuttal, testified as follows:

Direct Examination by Mr. Millar.

My name is Allen D. Whipple. I live in Alexandria, Indiana. My occupation is chief engineer of the Aladdin Industries. I was educated at the Massachusetts Institute of Technology, Boston, in the class of 1902, taking a special course which would nominally be called electrical engineering, specializing in mathematics, physics and chemistry.

My first work at what would qualify me for testimony in connection with heat insulated containers of either the vacuum or non-vacuum type was gained with the Western Electric Company before 1910 in the development of the telephone switchboard lamp in which the problem of
321 preventing the flow to heat from an incandescent fila-
406 ment to the walls of the lamp structure and to the surrounding telephone apparatus was of prime importance.

At a later period I was engaged in the structural engineering profession erecting reinforced concrete buildings for malt houses, grain elevators, cold storage buildings, ice cream factories, and so forth. These buildings all involved the same problems of determining the flow of heat through the walls of the containers.

For the past four years I have been with the Aladdin Industries at Alexandria, Indiana, engaged in the development and improvement of heat insulated containers.

For nine years prior to that I was director of research for the Association of Manufacturers of chilled car wheels dealing with metallurgy of chilled iron and with the problems of tracing the flow of heat in metallic structures such

as car wheels where the gradients are extremely long and the necessity for accurance in pyrometry is of the greatest importance.

I am familiar with a substance called Zonolite. It is the roasted product resulting from heating a micaceous shist or ore.

407 I have read the testimony given in this case by Mr. Norris Fay Murray, a witness for the defendant, as given on page 158 of the transcript:

"Q. What are the properties of Zonolite with refer, ence to the absorption of moisture?

322 "A. We found that it is what we call non-absorbing. Water will adhere to it. It will mat up when wet, but it will not absorb water to any great extent. There is no capillary attraction between the fibers."

I do not agree with that statement. I consider Zonolite

408 to be extremely porous. I can demonstrate my last statement to the Court.

Mr. Millar: I hand the witness Defendant's Exhibit 12 which has been previously identified as being a mason jar filled with Zonolite of the type used by the defendant in its commercial jars and also a glass of water.

The Witness: I have here a piece of glass which has a non-absorbent surface, and since water is colorless and it is difficult to observe what happens with it, I propose to place and do place a drop of ink, which is simply colored water, on this piece of glass, and lay a piece of Zonolite upon it in order that we may see whether or not the ink is absorbed by and into it and through the piece of Zonolite. It is. The conclusion is that so far as ink is concerned Zonolite has strong capillary properties. It picks up the ink from the surface of the glass almost entirely.

323 Now, it may be argued that ink, although it is colored water, has been treated to reduce its surface tension, so I will place on the glass a drop of water, and again you will see, I am putting a piece of Zonolite on to it, that the water is absorbed. The drop of water has disappeared from the surface of the glass and the addition of further drops of water to the surface of the Zono-

409 lite shows that it enters readily into the Zonolite without any question and that when picking up the piece of Zonolite and squeezing it strongly the water drops out upon the piece of glass. We cannot escape the conclusion that

Zonolite has strong capillary properties and will absorb water.

I am familiar with the vacuum bottles of commerce to-day. I am familiar with the terms commercially applied to vacuum bottles and parts. A vacuum bottle filler in the parlance of the vacuum bottle industry is the combination of an inner and outer glass container sealed together, silvered on the outer surface of the inner, and on the inner surface of the outer, and exhausted to a high degree of vacuum and sealed in that condition. That is the common term applied to that particular device I have just described.

The efficiency of a vacuum bottle, so far as heat resisting qualities are concerned, is very high. In my opinion, as to what difference would be made in a vacuum
410 bottle filler as to whether it was encased in a protec-
324 tive jacket or whether or not it was surrounded with heat insulating material or whether or not it was merely the naked vacuum bottle filler, there would be very little improvement by jacketing in its resistance to the radiation of heat.

Relative to the efficiencies of heat insulated receptacles of both vacuum and non-vacuum types, during the past six months I have done little testing of the vacuum type of heat insulated containers, but I have been actively engaged in the testing of the non-vacuum type of heat insulated containers for the purpose of improving our products. I have found that much can be done to improve the bottle by a close observance of the control of the many variables that enter into the structure. I have found that even with as good control as one can practically give to the variables that successive bottles have varied efficiencies, and that safe figures for determining the values of the bottles in regard to over-all efficiencies can
411 only be obtained as an average from a number of bottles. Individual bodies will vary between themselves however carefully they may have been manufactured.

I have read the testimony in this case of Martin D. Becker, the testimony of Cromwell Bowen and the testimony of Frank L. Session, particularly with reference to a report prepared by Mr. Bowen and I have read the report of Mr. Bowen.

325 I have read and am familiar with the contents of the report identified as Defendant's Exhibit 8. In

view of the tests I have recently made and the experience I have had, the report itself, in my opinion, is valueless and the conclusions drawn from it are unwarranted. As I read the testimony, I made a few notations for my own information and have them on this piece of paper.

It must be remembered that heat is a particularly elusive commodity. It is difficult to measure. Pyrometry is a highly specialized art. Up to the present time no
412 perfect insulator for heat has been discovered. However, the vaccum, and by that I mean a perfect vacuum or as near a perfect vacuum as it is humanly possible to obtain so far is the best possible insulation against the passage of heat. It is also to be remembered that heat radiates or tends to radiate in all the directions from a source. There are many variables in a heat insulated container.

First of all, that container consists of a multiplicity of parts, each of which ahs variables. The inner container, for instance, has quite a series of variable. It is usually made of clay, burned clay, such as we commonly term as earthenware. The variables in that clay structure start early in its manufacture. They start with the amount of water contained in the clay, this water being used to render the clay plastic. The amount of water contained and the degree of pugging or mixing which the clay has to incorporate air within it will have a large bearing upon the porosity of the final piece of ware and a
326 bearing upon ots heat insulating and its heat holding capacities. The drying of that ware causes it to shrink from the size in which the workman originally worked it up.

The weight of the individual pieces of clay ware have,
413 therefore, a variable beyond the control of the workman, because the clay may or may not contain a greater or less amount of water. The distribution of clay in the finished piece of ware is also a variable depending upon the workmanship. It is entirely possible to produce two clay containers which will weigh alike, but the neck of one may be thick and heavy and the remaining clay be distributed in the side walls of bottom of that container, or the neck may be just the opposite, with the clay in some other portion.

It is evident that a thick-necked clay body will conduct heat from within the container towards the top of the

neck more readily than a thin-necked body because of a larger mass or material to conduct the heat.

The burning of the ware may introduce a variable. As the dried clay is burned to produce a vitreous body that degree of the condition which we know as vitreous is obtained only with time and heat and the degree to which the temperature has been raised. It is entirely conceivable that heat applied to one side of this piece of clay ware shall render it more vitreous, more heat conducting, more dense on one side than it is on the
326 opposite side, so that variables in a horizontal plane around the neck and the base of the ware are to be
414 expected. These variables, of course, I am speaking of are related to the heat conductivity of the material itself when finished.

Then, too, there is the question of glazing of the ware. If the glaze which is applied to the earthenware be well done, workmanship be perfect, and the firing be such as to prevent crazing, cracks and bare spots on the inside of the ware, the water will not readily percolate into the porous clay, but if it cracks or crazes due either to faulty workmanship, or due to faulty workmanship in burning, or faults in the composition of the clay glazing, the moisture can find its way into the walls of the vessel and the heat insulating value of that clay will be much reduced.

The diameter of the ware changes with the amount that it shrinks in drying, and the amount that it shrinks in burning in the kiln, and as the diameter decreases so a given quantity of water placed within, or other liquid placed within the container will have its level at the top nearer or further from the end of the neck. The length of the neck is an important feature for determining the distance or length of the path over which heat must pass from the heated liquid to escape to the air.

415 So it will be seen in the matter of the inner container alone there are many variables that can affect the
328 ability of the ware to transmit and radiate heat both in an over-all sense and in the sense of positional locations on that ware.

The next material that I would like to discuss between the inner container and the shell is the so called insulating substance that is used between. It has a number of variables. It is dependent for its value as a heat

insulator upon the number and size of the air cells that are entrapped. The greater the number of air cells the better it will be as an insulator, and it is not the solid material of which the insulator is made that serves as a heat insulator, but it is rather the entrapped air and divided cells that really give the insulating efficiency.

416 It is quite important to know what the condition of the air in those cells may be. If the air be dry then the insulator exhibits good values. If the entrapped air be saturated with moisture it is then a very poor insulator and the insulating value of the packing material will consequently be reduced.

Then, too, there is the question of the compactness of the insulating material. Most materials that are used for this purpose have an optimum degree of packing so that if they be too loosely packed their insulating value will be low, and if too strongly packed their insulating value will be low. The optimum degree of packing for each individual material that is used is different and must be determined for each material.

329 In the use of granular or powdered insulating materials there is a practical difficulty that enters in the filling of shells that is sometimes referred to as bridging. That is a quality whereby the material seems to leave gaps or void spaces of considerable size that are not filled within the shell. Now, then, it must be evident that where such areas of unfilled space between the inner and outer container exists there will be a variation in the heat insulating value at that point. These are the principal variables in connection with the insulating material.

417 Now, passing to the outer shell of the heat insulator, I find there are several variables. First of all, there is the kind of metal that is used for the outer shell. It is a matter of common knowledge that different metals have different rates of thermal conductivity and the surface finish and colors, even, affect the radiation from the surfaces of such containers.

It is a matter of common knowledge that rough black surfaces radiate heat more rapidly than do highly polished light colored surfaces. There may be a difference also in the ability of the shell to radiate heat as to whether it has been lacquered or has not been lacquered, its shape, its area, and the approach of the metallic portion of the shell to physical contact with the inner con-

tainer also has its affect upon determining the
330 amount of heat that can escape by a metallic path.

Now, these variables that I have been speaking of may group themselves in various manners. They may group themselves so as to give positional effects widely varied without materially varying the over-all efficiency of the jug or container as a whole. Since heat, as I said in the beginning, tends to radiate in all directions from
418 a source it must be evident that even though one spot on the surface of a shell might be backed up by a material that had considerable insulating value, still the flow of heat from higher temperatures around through the steel shells would mask in large degree the changes in temperature at any one point.

Furthermore, the measures of such temperatures is extremely difficult. There is nothing in the whole science of pyrometry that is more difficult than the determination of true surface temperatures, especially by means of thermocouples and potentiometers. The evidence does not show, as I read it, that these thermocouples that were used were calibrated. Of course, it is a matter of common knowledge that thermocouples when made are subject to contamination at welding, the characteristics of the couple may be changed, and I have in my own experience had couples carefully made that varied in their indications of millovoltages developed and consequently in the temperatures indicated, from three to five de-
331 grees when made of apparently the same material.

After manufacture thermocouples are subject to contamination by misuse. They may be oxidized. They may be contaminated by contact with other metals.

Furthermore, the flow of heat from a surface to a thermocouple is a function of the amount of contact between that thermocouple and the surface being measured.

419 It was pointed out in connection with the report given by Mr. Bowen that a thermocouple would give some kind of a compromise indication between the temperature at the surface of the shell and the surrounding air. To overcome that difficulty he placed a rubber band over the thermocouple and apparently did not take into consideration that it also, being of a solid material, would conduct some heat from the point.

He did state that fine wires were used in the thermocouples. Wires are also conductors of heat and carry

heat away from the junction, so that it seems to be quite impossible to believe that the uncalibrated couples used as described positioned at some locations on the shell that any data could be obtained which would be of any value with respect to the indication of the thermal insulating qualities of the bond or seal disposed between the shell and the inner container.

It is for that reason that I believe that such an un-
332 scientific report as this seems to be is worthless for the purpose mentioned and that the conclusions drawn from it are unwarranted.

420 There is no evidence that the variables I have referred to in my testimony, have been considered at all in the tests that were made and the report referred to by Mr. Bowen.

Most assuredly the variations in temperature as indicated by the report could be accounted for by the failure to take these variables into consideration, because in our test work we find that even though we do use considerable care to select inner containers that shall be representative one of the other most comparable, at least, and use our best efforts in controlling the various variables that I have described here, successive bottles will have variations in beyond the over-all efficiency and in positional efficiency fully of the order shown by this report, and if we made tests on a number of Aladdin jars or any other similar jar of the same manufacture selected at random from stock we would find variations of that order.

421 We would not think of drawing conclusions as to the efficiency of those bottles on readings taken from any individual bottle but only as an average from a number of bottles.

In determining the value of a bond and seal disposed between the neck of the jacket and the neck of the
333 container of a heat insulated receptacle of the type of Plaintiff's Exhibit 6, as a conductor or non-conductor of heat, due to the many variables that I have pointed out and the fact any surface temperatures existing on the outside would mask the value of the bond or sealing material I would certainly measure that material in a position entirely removed from those variables and determine its efficiency as a material per se, and in a heat insulated receptacle of the type in suit, if there were no bonds or seals in the metal neck of the jacket and the

neck of the container or the container, I would say that there might be a variation in degrees similar to those shown by the report. I think that indication would not be a measure of the conductive value of the bond and therefore would be immaterial.

422 By an examination of the material disposed between the neck of the jacket and the neck of the container in Plaintiff's Exhibit 6, it appears to be sulphur. I certainly consider sulphur to be a water excluding bond. Sulphur will adhere if poured into that position in a hot molten state. I certainly consider the sulphur to be a seal as herein used.

Mr. Cromwell: Object to the leading form of the question.

The Court: Objection overruled.

The Court: Q. Does the sulphur adhere to the earthenware?

423 334 A. It does. It apparently has been broken away from the aluminum by the expansion of the shell in the cut, but without cutting the shell it would adhere due to the fact that sulphur on cooling crystallizes and expands so that it would have a mechanical pressure as well as whatever bond might be created by the liquid material flowing into the pores of the material with which it is in contact when molten.

Cross-Examination by Mr. Cromwell.

Zonolite is not subject to rot or to decay. The presence of moisture would not have any effect on causing oxidation. It loses its shape when it is wet, under pressure. Not very much pressure would be required to cause it to lose its shape. We illustrated here this morning it
424 was easily deformed when wet. I pressed it with my finger. Approximately I would say the pressure exerted at that time was a few pounds per square inch. I would rank Zonolite as flaky. It may be considered in its ultimate division as being flakes, although it occurs as shown here in small granules. I stated that that was obtained from an inorganic substance. I would regard Zonolite as losing its insulating qualities or value if it were moist.

If the entrapped air cells are communicating one with

another then the diffusion of moisture throughout
335 the atmopshere would naturally follow according to well known laws of physics. That the communicating air cells do communicate was shown by the demonstration this morning when the ink went completely through the piece traveling only in the interstices between the solid matter and through those air cells. I experimented only ou a single granule. Where they are all
425 brought together in a mass such as I find in the space between the jacket of the jug and the container of the jug, there will be a tendency for the moisture to diffuse through the air cell, communicating air cells, until an equilibrium has been established using the amount of moisture that is available, with results of a reduction in the insulating value of the material due to the saturation of the air which then becomes a good conductor instead of a poor conductor when dry. If there is no air there it would not be a good insulator.

If the voids through the granules of the Zonolite open at all through the water the diffusion of the water into
426 that air will occur. If they open at all moisture will diffuse into the air within those cells, and if they don't open at all moisture probably would not diffuse through the air. The granules of Zonolite will usually float on water. That would not indicate the fact that they would not become absorbent. An inverted dishpan will float on water even though the air within the dishpan may be well saturated with water. I liken that to a granule of Zon-
336 olite. If enough such small bodies of air be entrapped then the apparent density of the particles will be below the density of the water and consequently the composite mass will float. If these voids of the gran-
427 ules were completely filled with water the particles would sink. The fact that they do float indicate that they retain some voids.

Zonolite possesses even more hygroscopic properties than dried cork. My reason for that conclusion is tests of material of the same character as Zonolite, Zonolite being but a trade name for a material that is furnished under several names and of the same type and material. I have made tests on material of similar characteristics known as Jeffercite, and other trade names.

I have stated certain conclusions with reference to the variables of the clay containers of these jugs. I recog-

nize that all of these containers vary one from another, in certain respects; that there is very little uniformity with reference to their production.

So far as the general mass of these jugs containers is concerned, the average is the only safe figure upon which
428 to act. Their individual measures are not correct.
337 I would strike an average by taking individual measurements of a large number of pieces and averaging the results. The Mantle Lamp Company does that in all its test work for development and improvement with reference to the containers it puts into its jugs. We find in these jugs a considerable and significant difference in the thickness of the necks of these clay containers. In adapting the containers to the metallic tops of the jugs, in production, we have adopted those methods which seem to
429 give the best average result. Provision has been made by the selection of material which has shown by average tests that it is most efficient. That material in the case of the Mantle Lamp Company jug is a meltable organic material possessing waterproofness, adhesion both to metal and to the container, when in a molten condition, the ability to solidify and to be perfectly inert from further influences of heat and moisture at a later period. That substance is not particularly a gummy substance. It is derived from shellac or something of that nature. It is a shellac composition.

430 Assuming that substantially none of the variables I have enumerated was present in the jars tested by Mr. Bowen and that the thermocouples and the potentiometer were accurate and correctly read and reported, I would still say that the tests were valueless.

I am the chief engineer of The Mantle Lamp Company and I have held that position for some years. I said
338 that if the thermocouples which were employed by Mr. Bowen in those tests had not been calibrated they would not be reliable. If they were calibrated they would have been reliable insofar as their ability to develop definite millovoltages is concerned at definite temperatures, I would say yes, when the cold junction is held at the proper low temperature.

431 C. W. DAVIS, called as a witness in behalf of the plaintiff in rebuttal, having been previously duly sworn, testified as follows:

Direct Examination by Mr. Millar.

I am the same Mr. Davis who has previously testified in this case. In my opinion the container in Defendant's Exhibit 1, which has been broken away in this case, may be moved relative to the jacket to which it is apparently rigidly connected due to the flexing of the jacket itself.

As to a pendulous movement of the container relative to the jacket assuming that the container were completed. In devices of this class in which the containers have a capacity of approximately one gallon, we would have when the container was filled contents which would weigh approximately eight and one-half pounds. That weight added to the weight of the container itself
339 would make a total weight of in the order of eleven or twelve pounds. The center of the mass of that
432 weight would be disposed approximately five inches below the point at which the container is supported. In swinging or striking the outside of this container against an object the inner container, being suspended at its upper extremity only, will possess a momentum or inertia of force which will inevitably give slight lateral movements which are resisted by the packing or the flex of the metal in which it is contained.

Referring to the Blair patent in suit, Plaintiff's Exhibit 1, lines 27 to 37, inclusive, on page 2 of that patent "The space between the jacket, and the container, 11, is filled with a comminuted substance 31, of poor heat conducting properties, such as cork, and this substance is packed with sufficient density to prevent violent pendulous movement of the container occasioned by shocks administered from without the receptacle, while permitting the expansion and contraction and the slight bodily movements of the container which are produced by changes of temperature." That statement is very succinct and I understood it by myself to represent the limitation of lateral or oscillatory movements induced as explained.

I heard the witness C. R. Wright testify that the first

433 type of heat insulated receptacle made by the Macomb Manufacturing Company, that with the jacket con-
340 tracted into a slot in the neck of the container, was as efficient as the kind they are now making where the necks of the jacket and the container are united by a bond. I do not agree with that testimony. I am familiar with the particular devices referred to. I have seen a Macomb Manufacturing Company jar with a slotted neck, and I have seen a jar manufactured by the Macomb Manufacturing Company having a bond between the neck of the jacket and the neck of the container. I don't know that they are now commercially using them. I have tested both of those jars as made by the Macomb Manufacturing Company. As to the relative efficiency of those two types of jars, when the Macomb jar was first introduced I secured samples, exam-
434 ining the construction and testing the efficiency. In the use in tests of those jars I found that the seal which was on the outer side at the slot broke away in just the same manner that the witness described it did do. I found that when that seal was broken away and moisture was allowed to enter between the container and jacket the efficiency was not as great as in the later type of jar where they were properly sealed and moisture was precluded from entering and mixing in with the comminuted material.

341 I have conducted or had conducted under my direction, experiments for the purpose of determining the relative efficiency of heat insulated receptacles of this type where moisture is contained in the insulating material on the one hand and where the insulating material is dry on the other. As a result of those tests I have proven and know that water if allowed to mix with the comminuted material will radically reduce the efficiency of the insulated container.

I have had experience in the manufacture of vacuum bottles. For the past fifteen or sixteen years in connection with my duties with the company with which I am employed I have had charge of the research work and actual manufacturing work incident to the making and
435 marketing of vacuum insulated containers.

I am familiar with the term "heat insulating vacuum." Heat insulating vacuum differs from other vacuums, in that other vacuums are employed in engineering work in the operation of steam condensers, vacuum heat sys-

tems, and many other purposes. If the vacuums are of the order of one-half, or lack one-half or a quarter of an inch of mercury of being a full or complete vacuum. If the engineering work in that classification if the atmospheric pressure in any one day was thirty inches of mercury in vacuum or twenty-nine and half inches of mercury in that class of work would be considered high.

Twenty-nine and three-quarter inches would be very
342 high. Such vacuums, however, in heat insulating work in connection with vacuum containers are ridiculous. I have conducted experiments and directed experiments and have proven that in order to produce a
436 heat insulating vacuum it is necessary to draw a vacuum of an entirely different order. Perhaps I can best explain that by saying that thirty inches of mercury is approximately equivalent to 960 millometers of mercury, and in all scientific work the metric system is used. To produce an insulating vacuum it is necessary to establish and maintain a vacuum of the order of two microns, or one micron.

Mr. Cromwell: I don't see the materiality of this. This case is related to a non-vacuum jug. This distinction of the completeness of incompleteness of a vacuum is not in this. I don't see the pertinency or the materiality of it.

The Court: Let him go ahead.

A. A vacuum in the order of two microns means 1/500 of a millometer, one micron being 1/1000 of a millometer, as we find approximately twenty-five millometers per inch, and a vacuum of 2/1000 of a millometer, which we reduce to inches of insulating vacuum, we find a vacuum in the order of 1/12000 of an inch or a vacuum in an order ridiculous to attempt to measure in any devices commonly used for ordinary vacuum work in condenser work and where ordinary vacuums are employed.

Heat insulating vacuums are created with the use
437 343 of very special pumps, especially designed for that work. They may be measured in two different ways. One way is by the passing of a high tension spark through the vacuum space and to note if that spark passes and shows a color and when that color becomes entirely removed. To start with, when a vacuum space has been evacuated to a degree of approximately five microns,
344 a high electrical potential between the terminals of that vacuum will start showing that color. That

color is of a pinkish purple color. As the vacuum is continued and the order of the vacuum is greater, that color gradually changes and finally at approximately two microns the color is very light in color. The electrical discharge through that space will be intermittent and very light and faint in color and can be hardly seen except in a darkened room.

438 It is customary in the evacuation of heat insulated bottles to do that work in a dark room, so that the electrical discharge can be seen. Now, in a physics laboratory or in a vacuum bottle plant we also have the type of gauges known as McCleod. That gauge depends upon a multiplying or concentration of the residual gases left in a vacuum space to a degree of one thousand to one, or thereabouts, so that when compressed the gases can be measured. I have a sketch of a type of McCleod gauges, commonly used, in which I have shown in the sketch the essential elements of a McCleod gauge. This gauge is preferably made entirely of glass. We have a ball A in the line of a glass circuit to which the vacuum bottles being evacuated are connected, and also the evacuating pumps, and below this ball we have a juncture point B to which a second capular is connected leading down to a mercury tank. As the vacuum is produced by the pumps in either the bottle or the ball to which it is connected,
345 the mercury from the pump will be sucked up, and by degrees the level in that tank below the top of that mercury will be in exact juncture between the ball and the line leading out of the bottles.

When it is desired to measure the vacuum, that exists in this ball or in these bottles on the same line, this tank can be raised. As that tank is raised, it seals in the
439 juncture point which I have indicated at B, and all of the gases that were in the ball A are then compressed by raising the mercury into a very small capular at the top, and the size of this capular is approximately 1/1000th of the size of the ball, and in its compressed condition it can be measured. That is the essential way of operating a McCleod gauge for specifically measuring very high vacuum.

A heat insulating vacuum may be established in metal, but it will not maintain itself, due to the evolution of occluded gases in the metal walls. Now, that statement is a fact of common knowledge, and I noted with interest

that it is confirmed by one of the inventors, of whom there is a patent in this folder.

Q. Will you kindly refer to the Stanley patent No. 1071817 which has been pleaded in the Defendant's answer, but which they have not seen fit to offer in evidence, and tell us wherein you find the statement to which you have just referred?

346 Mr. Cromwell: How is that rebuttal?

Mr. Millar: Rebuttal?

Mr. Cromwell: Yes.

440 Mr. Millar: Why, we are endeavoring to show by this witness and by this patent that you cannot hold heat insulating vacuum in metal, and your witness said it could be done. That is rebuttal.

Mr. Cromwell: I am asking with reference to this patent itself.

Mr. Millar: You pleaded this patent.

Mr. Cromwell: It is not in evidence.

The Court: He is producing it as authority, perhaps.

The Witness: It is common knowledge and authority, your Honor. May I proceed?

Mr. Millar: Has your Honor ruled?

The Court: He may answer.

A. Referring to the Stanley patent No. 1071817, which has been pleaded in the Defendant's answer but which they have not seen fit to offer in evidence and to the statement to which I have just referred, I find in this patent to William Stanley, on page 1, lines 21 and following, this statement:

347 "In order to produce bottles that are not liable to breakage, it has been suggested that shells be constructed of metal instead of glass, but such bottles have been found entirely unsuccessful, because the high degree of exhaustion required is not maintained in the vacuum space, probably because under the greatly reduced pressure the metal gives off gases for a long time, which reduces the degree of exhaustion to such an extent that the bottles have not great enough insulating power to render
441 them useable for most purposes, so that they are entirely impracticable."

I have seen, used, and tested the bottle called the Stanley Ferrostat Vacuum Bottle made in accordance with the disclosure in that patent. I can tell you the relative effi-

ciencies of the Stanley bottle just referred to, and glass vacuum bottles.

The Thermal efficiency of a glass vacuum bottle is much greater than that of the metal Stanley bottle. This is particularly true, as my tests have proven, that after the Stanley bottle is several months old, its Thermal efficiency is not as great as when it was new, while a glass bottle properly made retains its original efficiency. Mechanically, from the standpoint of breaking, the Stanley bottle is much more efficient than the glass bottle, which is very frail.

I have studied the patent to Burger and Aschen-
348 brenner, No. 13093, and am familiar with it.

442 Referring to the element E, which is found between the metallic casing and the outer wall of the double-walled glass insert, the specification does not clearly and specifically state what that cushion or protector E is made of, although it is implied it is made of the same material as the protector or cushion F, which is described as made of cotton, wool, asbestos or the like, colophony, shellac, sealing wax, or suitable rigid materials.

I do not find that the inventor describes the element E as being a bond or seal. The vacuum bottle filler is supported in the outer casing on the lower cushion, element F and centralized by the upper cushion, element E.

A cotton, wool or asbestos cushion would not preclude the entrance of moisture from seeping into the space between the jacket and the outer wall of the vacuum bottle filler.

If the vacuum insulation and the insulating qualities contained between the walls of the vacuum bottle filler
443 were destroyed, the air space between the jacket and the outer wall of the vacuum bottle filler would not serve as an efficient insulation.

Q. And is it your understanding that the disclosure of the Altenberg patent refers to the same device described by the witness Terry in this cause?

349 A. I have read this patent and understand it, and I agree with the explanation given by the witness Terry.

Q. Directing your attention to the material disposed between the neck of the jacket and the neck of the vacuum bottle filler, kindly tell us the characteristics of that substance as described by the inventor?

A. Page one, line 103, the inventor states in the specification that "The collar 21 may be of plaster of paris for holding the other vessels and the neck 22 of the casing in rigid relation."

Q. And by what means is the vacuum bottle filler supported in the outer casing?

A. It is shown as in direct contact with and resting
444 upon a lower pad at the bottom, element 24.

Q. And did you hear the witness Terry testify that they discontinued the manufacture of that type of container because the plaster of paris crumbled away from the neck, and the vacuum bottle filler settled down on the pad at its lower extremity, and allowed water to seep in between the jacket and the outer wall of the vacuum bottle filler, and become foul-smelling?

A. I recall hearing the witness state that the plaster of paris crumbled away at the top. I do not recall, although I may have heard, the balance of the evidence.
350 Plaster of paris, as used between the neck of the container and the neck of the jacket in this device, would not serve as a seal. I base that answer upon the known characteristic of plaster of paris to be a porous body through which water readily will pass.

From my experience as a manufacturer of vacuum bottles, I will tell you what I have found to be the fact with reference to the necessity of a support for vacuum bottles in a casing. I am in charge of a factory in the manufacture of these bottles, and the bottles, due to the necessi-
445 ties of manufacture, are frail, and the problem of making a successful commercial bottle is largely one of properly holding and supporting it within a metallic outer casing, so that in any shocks or injury to which the bottle may be subjected, it will not break the frail inner double-
351 walled vacuum container known as the filler.

Referring to the patent to Davis and Sunderlin, 1333795, I am the co-inventor, C. W. Davis. I knew Frank R. Sunderlin therein described. He was in charge of the machine shop of The Mantle Lamp Company of America. I also knew Lewis Van Deventer Blair, the inventor of the patent in suit. I first met Mr. Blair in January, 1918. Mr. Blair came to the factory of the Mantle Lamp Company of America to build insulated containers.
446 In the factory of the Mantle Lamp Company of America in January, 1918, Mr. Blair made insulated containers of the type disclosed in the Blair patent.

The occasion for the invention described in the Davis and Sunderlin patent 1333795 was, at that time the United States, our country, was at war. Mr. Blair made different models of insulated containers of the type shown in the patent in suit, these containers being of approximately five gallons capacity. I was requested to test the containers Mr. Blair had devised and as these containers were designed for Army use, to be used in warfare, I conducted such tests, giving those containers a very hard abuse which I anticipated would be necessary, or that the containers must stand such abuse before they could be accepted and be usable by an Army. I took the Blair devices and threw them on the floor, tipped them off tables, rolled them downstairs, and subjected them to
352 other excessive abuses to determine whether, in my judgment, such container would be suitable and acceptable to an Army.

As a result of those tests, a weakness of the Blair device was developed, as to what we considered would be necessary for Army use. We would take the bottles and
447 throw them on their end right onto the floor hard, and whenever or if the container would so strike that the upper end of the inner glass container and the outer jacket would hit the floor, there was a possibility of a rupture, and Mr. Sunderlin and myself worked on that problem, and developed this yielding diaphragm structure shown in our application, which was incorporated in the containers which we made and sold to the United States Government.

Q. I notice, Mr. Davis, that the filing date of the application of the Davis and Sunderlin patent is prior to the filing date of the patent in suit. Can you tell us why that was?

A. I know that containers incorporating the features developed by Mr. Sunderlin and myself were first publicly shown before the containers of the Blair type. I know that.

Mr. Cromwell: I move to strike the answer on the ground it is hearsay.

The Court: Q. Do you know that of your own knowledge?

A. I know that of my own independent knowledge.
353 The Court: It may stand.

Mr. Millar: Q. Now, again looking at the patent

of Davis and Sunderlin, will you tell us what is disclosed in that particular patent?

Looking again at the patent to Davis and Sunderlin, there is disclosed in that particular patent a heat insulated container of the type shown by the patent in suit to which additional features have been added,
354 as illustrated by the shock absorbing diaphragm, the
448 removability of the heat insulated unit, and other features of the corkage member.

Devices in accordance with the disclosure of the Davis and Sunderlin patent were manufactured and sold. During the time of warfare these containers of this description were sold to the United States Government, the Army, the War Department. That was during the war and prior to Armistice Day. I was called to Washington to consider slight changes in the original models which were submitted, and I know I was in Washington at least three months before Armistice Day, possibly before that.

Five gallons was the capacity of the containers made for the United States Army, as I have described.

Mr. Millar: I offer in evidence the sketch made by the witness Davis, as PLAINTIFF'S EXHIBIT 16.

Mr. Cromwell: It is objected to as immaterial and irrelevant.

The Court: Let is be received.

Mr. Millar: I offer in evidence the patent to Stanley,
449 No. 1071817.

Mr. Cromwell: I also object to that exhibit as immaterial and irrelevant.

The Court: Let is be received.

(Which said documents, so offered and received in evidence, were marked PLAINTIFF'S EXHIBITS 16 and 17, and same are in the words and figures following, to-wit):

450 355 *Cross-Examination by Mr. Cromwell.*

I am familiar with the suit of the Mantle Lamp Company against the Monarch Company that was previously determined.

Q. What was the form of the seal in the Defendant's device in that case? Wasn't it plaster of paris?

A. Pardon me. I don't know that I remember that.

Q. The Monarch Company?

A. I think the Monarch Company was the plaintiff.

Q. Well, I mean under the counter-claim that was filed.

Mr. Millar: I don't see where this is cross-examination, what happened in some other case.

Mr. Cromwell: He is talking about plaster of paris seals. I want to find out about them. He has not hesitated to give expressions as to these plaster of paris bonds, and so forth.

The Court: He may answer that.

Mr. Cromwell: I am asking him whether the bond in the Defendant's structure in that case under the counter-claim wasn't a plaster of paris bond?

A. I don't recall. It may have been.

451 Q. You have no recollection as to it, then?

A. Well, that suit was several years ago, and I cannot at this moment recall the specific nature of the bonds in the exhibits.

Referring to Defendant's Exhibit Number 1, if 356 the container that is attached to the cap of this exhibit were metal, instead of earthenware, it might possess some inherent flexibility of itself. The pendulous movement I have referred to, however, would largely depend upon where it was easiest for the inertia to dissipate itself, whether this would flex easier than the metal container.

Assuming that the metal container would be connected to the cap, just as the earthenware container in that exhibit is connected to the cap, it would have a pendulous movement.

It is not possible to obtain an absolutely complete 452 vacuum. I have never known of such. The most complete vacuum that has ever been obtained in any test which I have conducted was one-half micron, which would be 1/50000th of an inch.

357 I believe 37 and a decimal are the number of inches there are to the meter. I don't recall the exact decimal. It is approximately 37 and a fraction. There are one thousand millimeters in a meter. Computed in inches the value of a millimeter would represent approximately 1/25th of an inch.

To require 960 millimeters to produce a vacuum, de- 453 pends upon the atmospheric pressure where I made it. The atmospheric pressure at sea level is approximately

14.7 pounds per square inch, and that is 30 feet of water, about 30 inches of mercury, it is measured in different ways.

What I meant when I said 960 millimeters is required to produce a vacuum, that, as I recall is approximately another way of expressing atmospheric pressure, 14.7 pounds per square inch and I believe that is approxi-
454 mately 960 millimeters. I may be slightly wrong in that statement, but that is a relative statement. I don't recall the exact figures. It is a matter of common knowledge what they are. I am confused by what you really want. You are speaking of producing a vacuum by inches of mercury, or something of that kind. I produce vacuums with pumps, and measure columns of mercury. I did not say it required 960 millimeters to produce a vacuum. I said it took vacuum pumps and aspirators and equipment of that kind to produce vacuum. The significance of the 960 millimeters related to those pumps might
358 be a way of showing pressure. It is common to show pressures by columns of mercury. If you have mercury in a barometric gauge, it is usually in a closed tube, with part of the mercury open to atmospheric pressure.
455 The atmospheric pressure will press the mercury up the tube, and it can be read to show the relative pressure or specific pressure of the atmosphere.

The vacuum such as can be obtained would register approximately 30 inches. Those are very rough figures, they are not used at all in heat insulating vacuums, they are only used in ordinary vacuums of equipment for water condensers and heating systems and that class of work. We do not ever use the expression "inches of water" or "mercury" or anything in vacuum work. We confine ourselves entirely to the scientific convention of the metric system and talk in microns.

The Court: Let me see. The ordinary atmosphere will hold up about 30 feet of water, is that it?

A. No, no. The pressure of the atmosphere is equivalent to a column of water appdoximately 30 feet high. If you had water with a vacuum in a tube, closed, the atmospheric pressure would press the water so it would run up about 30 feet. It would send up mercury about 30
456 inches. The vacuum which I have in one of these vacuum bottle fillers would send that mercury up within one micron or two microns of all a perfect vacuum could do.

The atmosphere will drive the water up 30 feet;
359 the ordinary atmosphere will drive mercury up 30 inches. The vacuum in the ordinary vacuum bottle filler would produce a mercury pressure within an infinitesimal part of an inch of the full vacuum, which may be 30 inches. If the atmosphere is driving it that far, the vacuum that is created will be of that magnitude.

The Court: Is that what he means? That that
457 vacuum will still allow that pressure to go up 30 inches?

Mr. Millar: Assuming that the atmospheric pressure is 29.9, almost 30 inches, you cannot tell the difference with the naked eye. That is what he means.

The Witness: It takes a multiplying gauge to tell the difference between that and the atmospheric pressure.

Mr. Millar: The gauge hand describes it in millimeters, a thousand to one, and when you have got an insulating vacuum, you then show one millimeter on your gauge.

The Court: Let's see if you are right. The ordinary atmosphere will drive water up 30 feet.

Mr. Millar: Yes, approximately.

The Court: And the ordinary atmosphere will drive mercury up 30 inches.

Mr. Millar: Well, we will assume it is 30 inches, yes.

The Court: Approximately.

Mr. Millar: Yes.

360 The Court: Now then, how much will the weight of whatever is in the vacuum bottle filler drive up the mercury?

The Witness: It will not drive it at all.

Mr. Millar: To a thousandth of a millimeter less than 30 inches.

The Witness: Pardon me. That is not right.

The Court: Well, let's see.

The Witness: No, that is not right.

458 The Court: I cannot believe that is so.

The Witness: That is not right. The vacuum will not drive the water up at all.

Mr. Millar: No, I ignored that part of it.

The Court: Will it drive it up a very small portion?

A. The vacuum will not drive the water up at all.

Q. Just talk about the mercury. How far would it drive it up, can you say how far?

A. If you have the atmospheric pressure measured

in this room today, and it is up to 30 inches, that is complete atmospheric pressure.

Q. Yes, I know that.

A. Now, if you want to measure your vacuum, and if you had a perfect vacuum, that would elongate that column of mercury, that would elongate it all but that very little infinitesimal part.

The Court: That is what I wanted to know. But
361 that wasn't what you said, Mr. Millar.

Mr. Millar: No. I had it the other way. That is my mistake, Judge.

The Court: What he said heretofore sounded more like what you said.

The Witness: I had to answer the question.

The Court: I don't say he wasn't telling the truth, but to one that doesn't know anything about it, it
459 sounded like what he said heretofore.

Mr. Millar: That was my understanding of it, and the drawing here indicates the difference, and multiplied a thousand times would be one millimeter. That I understand.

Mr. Cromwell: Q. Will you please turn to the Burger and Aschenbrenner reissue patent, No. 13093, and I call your attention to the matter appearing in lines 64 and 65 at page 1 of the specification of that patent, where it says colophony, shellac, sealing wax, or other suitable rigid material might be employed. Would you regard either one of those as a material that would exclude moisture?

A. If placed in the position of the element E and melted and solidified in place, they would so function but not unless placed there and under the conditions I have explained. If they did not melt it, they would be put there in a comminuted condition. I didn't find anything in the drawing in fig. 3 to indicate a comminuted condition, with reference to the element E.

460 362 As to whether plaster of paris being used as a bond requires the addition of water to the powdered plaster of paris, the plaster of paris of commerce is a dry, powdered material, which is anhydrous, and by the addition of water a paste material is produced which, when it is allowed to set, solidifies in a solid body.

Q. And that body becomes a cement, doesn't it?

A. In what way do you use the word "cement"?

Q. From the fact that it adheres to something it may be brought into contact with?

A. Decidedly otherwise.

Q. And binds parts together?

A. Decidedly otherwise. One of the great advantages of plaster of paris is that it may be used for making reproductions or casts. You can pull plaster of paris over substance and remove it to get a mold. That is one of its principal uses.

Q. But, if in this plastic state, it were introduced between two parts, and it hardened, those parts would be held together by the plaster of paris, wouldn't they?

A. If some provision for interlocking was provided.

461 363 FRANK C. TERRY, called as a witness on behalf of the plaintiff, in rebuttal, having been previously duly sworn, testified as follows:

Direct Examination by Mr. Millar.

I am the same Frank C. Terry who previously testified in this case. I am and I was familiar with the types of heat insulated receptacles on sale in the United States in 1908 and I was familiar with the types of heat insulated receptacles on sale in the United States in 1918.

The type of heat insulated receptacles on sale in 1908 in the United States were vacuum heat insulated receptacles. The sizes were one pint and one quart. The kind of heat insulated containers on sale in the United States in 1918 were one pint and one quart.

The sales organization I was connected with in
462 364 1918 had between 30 and 35 traveling salesmen on the road and offices in New York, Cincinnati, Chi-
463 cago and London. Our sales force covered all of the United States.

WILLIAM SIMONSON, called as a witness on behalf of the plaintiff, in rebuttal, having been first duly sworn, testified as follows:

Direct Examination by Mr. Millar.

My name is William Simonson. I live in Cincinnati, Ohio. My business or profession is practicing chemist.

I have been engaged in the practice of my profession some 25 or more years.

I knew Mr. Lewis Van Deventer Blair. I became acquainted with Mr. Blair when he called on me about mid-winter in 1917,—sometime in February 1917, at my place of business in West Ninth Street, in Cincinnati.
464 He called upon me at that time at the instance of his father, who made the suggestion that I might be acquainted with materials of construction for some purposes of which Mr. Lewis Blair, the son, would make application. His immediate need was for a silvering solution, or method of applying it to glass or vitreous surfaces. We carried out considerable tests which had to do with various methods. Our objective was to
365 use one which brought in the lowest quantity of chemical relative to the silver it would deposit.

Mr. Blair had a place of business in Cincinnati, in 1917. He had quarters at the southwest corner of Fourth and Main Streets. Mr. Blair is dead. His death occurred in early April 1922. Mr. Blair, when I first became acquainted with him, was engaged in constructing heat insulated packages. I visited the place of busi-
465 ness of Mr. Blair in 1917 a number of times. I saw in Mr. Blair's place of business some completed packages which he had built, and a number of the materials and parts of the cases which he had put together. He had a number of sizes of glass containers, and also a number of pieces of metal jackets, and a quantity of insulating material which had been used in building up the construction. He had several completed devices there at that time. I recall more particularly a package which held about a gallon. Of that particular device, the interior part was glass, the exterior was metal, which had been formed or spun into a jacket, leaving a space between the jacket and the inner or glass container. The quantity of filling material which I do not now know the composition of, had been used or was being used, and
466 the inside and outside pieces were connected with some fusible material, it appeared to be fusible, so as to join them together. That fusible material was placed around the neck of the glass, and within the neck of the
366 outer jacket. I only know that there was other material between the wall of the jacket and the wall of the bottle from the fact that such packing material was

on the work table, along with other elements of the finished article.

I know Mr. Viltor S. Johnson, President of The Mantle Lamp Company. I first met Mr. Johnson in the Autumn of 1917, probably October or early November. He called on me in the Autumn of 1917 relative to the packages which Mr. Blair had been constructing. Thereafter I did work for Mr. Johnson, with relation to these heat
467 insulated receptacles. That was partly in December 1917 and in January 1918, and for an extended period at his place of business in April, May and early June of 1918.

The particular problem I was working on in December 1917 and the spring of 1918 had to do with the joining material for the inner and outer packages, which were built to work at an atmospheric pressure of a 100 vacuum.

Referring to United States Letters Patent 1309967, heretofore offered in evidence as Defendant's Exhibit 5-N, which appears to be a patent issued to William W. Simonson and Lewis V. D. Blair, assignors to the Mantle Lamp Company of America, I am the William W. Simonson therein described as being a co-inventor.

Referring to letters patents No. 1497764, issued to William W. Simonson and Lewis V. D. Blair, assignors, to the Mantle Lamp Company of America, I am the
367 William W. Simonson therein described as being the
468 co-inventor. The Lewis V. D. Blair mentioned in both of those is the one to whom I have referred a few minutes ago as living at that time in Cincinnati.

When I was at the office or the factory of The Mantle Lamp Company in the early spring of 1918, Mr. Blair was engaged there on some experimental work. I particularly remember he was packing the parts of a package with some insulating material, which was at that time, if I remember rightly, cork dust. However, he had other material which he was using. The heat insulated receptacles of the non-vacuum type that I saw Mr. Blair constructing in the plant of The Mantle Lamp Company in the spring of 1918 were of several sizes, but this one I referred to a moment ago was small, I think it held about half a gallon; but he had a larger package there. The large capacity held about five gallons, I should judge.

Referring to United States Letters Patent to Lewis

Van Deventer Blair, 1435199, I am acquainted with that structure to a considerable extent.

469 That is substantially the same structure I sak in Cincinnati in 1917.

Mr. Cromwell: I object to the comparison with the drawing, your Honor.

368 The Witness: It is substantially the same package.

Mr. Millar: This man certainly knows.

The Court: The answer may stand.

Cross-Examination by Mr. Cromwell.

I last saw that particular package which Mr. Blair was working on in 1917, I think in either September or October of that year. I don't recall the date. I know it was in early Autumn that I happened to be in his place of business.

I have testified to certain dates here today, solely from 470 memory. I have no records before me or which I have consulted as to those dates.

I am not now in the employ of The Mantle Lamp Company. I conduct a business on my own account. I have not been engaged by The Mantle Lamp Company for a very considerable period. The last time was probably six or more years ago, and that was a short period of two months. That was on a different topic entirely. When I was in their employ in 1918 or 1917 I was through this particular item in suit early in June, but I was engaged by them on another topic about a year and a half afterwards.

Redirect Examination by Mr. Millar.

I have a very clear recollection of all of the dates 369 of these relative happenings. One particular event 471 that happened that fixes those dates in my mind, was the date we entered the World War, it was early in April, about a week before that I got through with this glass silvering. A few days after we entered the war I was sent down to Spanish Honduras in a search for mercury. That took about a month, or a little over a month. Immediately upon coming back, I reentered Mr. Blair's service.

Mr. Cromwell: I object to the answers of the witness not connected up at all with the dates in question, your Honor. I move to strike them out.

The Court: They may stand.

Adjournment to 2:00 P. M.

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472 VICTOR S. JOHNSON, called as witness in behalf of plaintiff in rebuttal, testified as follows:

I am the same Victor S. Johnson who testified previously in this case. I previously testified with reference to having met Mr. Lewis Van Deventer Blair, inventor of the device in suit, in Cincinnati in 1917.

I saw Mr. Blair during the month of January, 1918,
473 at the Mantle Lamp Company plant at 168 North Halsted Street, Chicago, Illinois. The occasion for Mr. Blair being in that plant at that time was, he was working with our engineers on heat insulated receptacles, particularly the heat insulated receptacle of the non-vacuum type which is shown and described in the Blair patent in suit.

370 Mr. Cromwell: I object to this, your Honor. This was all gone into on the case in chief. There isn't any question about it in the least.

Mr. Millar: If the Court please, there have been two patents offered in evidence as prior inventions and the purpose of this examination is to carry back of those and show what the sequence of events was.

The Court: Go ahead.

The Witness: In the plant of the Mantle Lamp Com-
474 pany in January 1918, Mr. Blair made heat insulated receptacles of the non-vacuum type like the receptacle shown in the Blair patent in suit.

I know Mr. William W. Simonson who testified this morning. I saw him in the plant of the Mantle Lamp Company in the early part of 1918. Mr. Simonson, at that time, was working with our engineers, including Mr. Blair who was at that time in our employ, on vacuum insulated receptacles and later on he worked with Judge Steward on patent applications.

I am familiar with the patent, United States Letters Patent 1,497,764. That patent embodies the work upon

which Simonson in conjunction with Blair, was working in the spring of 1918, they also worked on the non-vacuum type bottle, and they also worked on the sealing material of another patent.

I am familiar with the patent to Davis &
371 Sunderlin, No. 1,333,795. The occasion for the invention described in the Davis & Sunderlin patent was, Mr. Blair early in 1918 made up some gallon non-
475 vacuum type bottles like the container shown in the Blair patent in suit. He also made some larger containers of five gallon capacity. These five gallon containers were made up because we wanted some government business and we wanted to submit these to the United States government engineers at Washington, D. C. Mr. Blair made up these five gallon receptacles for the purpose of submitting them to the engineers in Washington.

Q. What do you say, Mr. Johnson, with reference to the characteristic of the Blair device as to whether it was sturdy or not.

Mr. Cromwell: I object, your Honor. That has been gone over.

The Court: Go ahead.

A. The Blair device, the one gallon bottles which Mr. Blair made up, were very sturdy. The inner container was made of quite heavy glass, and this gallon type container would stand most any shocks that it was administered to in the tests that we made, but when it came to the five gallon receptacles the inner container of this and the contents would weigh somewhere in the neighborhood of fifty pounds and in the tests that Mr. Davis made with these containers in conjunction with Mr. Sunderlin, we found that these containers would sometimes break when they fell on their necks. That is to say, when
476 the container was dropped down on its head they
372 would rupture or break away. The containers Mr. Blair had made, as I just testified, in our judgment were not strong enough for army use, so Mr. Davis and Mr. Sunderlin worked together and produced a yielding diaphragm which was interposed between the neck of the jacket and the neck of the inner vitreous frangible container. This diaphragm overcame the objections that we had as to the five gallon containers that Mr. Blair had made, and the five gallon receptacles of the Davis & Sunderlin type were submitted to the War Department,

the engineers, were thoroughly tested down there and with a few modifications in some detail were accepted and an order was given to us for the containers for government use.

The sequence of events insofar as the creation of the
477 devices disclosed by the Blair patent in suit 1,435,199, the Simonson & Blair patent 1,497,764, and the Davis & Sunderlin 1,333,795, the Davis & Sunderlin invention was produced after the Simonson & Blair and after the Blair device in suit. Insofar as the Blair & Simonson and Blair were concerned, the L. V. D. Blair device, or the patent in suit, was a device that was made prior to the Simonson & Blair vacuum bottle.

Referring to the fact that the applications for Simonson & Blair and Davis & Sunderlin were both filed in the patent office of the United States prior to the application for the patent of the Blair patent in suit, Mr. Simonson was with us only for a short time in the early part of 1918, I believe less than two months, and at the time
373 he was with us I brought on from Washington Mr. Steward, patent attorney of the firm of Edson & Steward, and Judge Steward was with us for probably
478 five or six weeks and during that time he was going over these matters and preparing the applications, and because Mr. Simonson was going back to Cincinnati in a short time it was decided to clean up all of the matters in which Mr. Simonson had anything to do, and therefore the first application that was prepared was the one of Simonson and Blair, that is on the vacuum bottles, and Simonson and Blair on the indurated organic compound with which he was a co-inventor with Blair. That is, he was a co-inventor with Blair on the vacuum bottle and the indurated compound. Mr. Simonson had nothing to do with the Davis & Sunderlin application.

The occasion for the filing of the Davis & Sunderlin application prior to the filing of the Blair application in the patent office was,—the first heat insulated receptacles of the non-vacuum type that were made for commercial production were of the type of Davis & Sunderlin and were made for the War Department and as soon as the receptacles had gone through the tests and had been accepted, and it may have been just before, I am not sure,—we filed the patent application of Davis & Sunderlin on this heat insulated receptacle in which the yielding diaphragm is incorporated.

479 374 I can explain the delay between the events I have just referred to and the filing of the Blair application on October 29, 1919. The one gallon containers of the Blair patent in suit we first started to make early in 1919 and Judge Steward came out later on in that year and was employed with the Mantle Lamp Company. He went to work for us and gave us one hundred percent of his time and it was very shortly atfer he came out there that this application was prepared and filed and it was just before the Aladdin Industries took over the manufacture—or the marketing end selling of these Blair one gallon containers.

Directing attention to December 1917, as to what arrangements were made with Blair and others in Cincinnati relative to the device that I saw in Cincinnati in the fall of 1917, we made an arrangement with the stockholders of the Keeplonger Company, who had interests in the invention of L. V. D. Blair and also W. W. Simonson—

Mr. Cromwell: I object. If this arrangement was
480 based on a contract the contract is the best evidence.

Mr. Millar: I haven't put the contract in evidence, but I am going to. I am laying the foundation.

The Court: Go ahead.

A. We took over all of the rights of Simonson, L. V. D. Blair, and all of the interests of the stockholders of the Keeplonger Company to whatever they had. We took over everything they had, lock, stock and barrel,
375 and entered into a contract to pay royalties. Blair was employed by the Keeplonger Company in December, 1917.

I have seen the document which has been marked as Plaintiff's Exhibit 18 for identification. I first saw it in December, 1917. I recognize the signatures appended
481 thereto. I saw the various pages of this document at various times. I saw the first page, dated December 29, 1917, in Cincinnati on or about December 29, 1917. The second and third pages, which is a letter signed by me as president of The Mantle Lamp Company, I saw on the date that I signed that letter, December 22, 1917. The next document I saw on or about December 29, 1917, in Cincinnati, Ohio. Those documents, since the dates they respectively bear, have been in our office excepting such
482 time as they have been in evidence somewhere else.

As a result of the signing of these various documents, the property and inventions of the Keeplonger Company were taken over by us, lock, stock and barrel, and we paid royalties to the Keeplonger Company on all of the non-vacuum type bottles that we made. The devices and inventions that were taken over by the Mantle Lamp Company at that time were the vacuum bottles of Simonson and Blair and the non-vacuum type receptacle of L. V. D. Blair, and the sealing composition of Simonson and Blair.

Referring to the words at the top of the third page
376 of this document, reading as follows:

"Under the foregoing conditions the Mantle Lamp Company agrees to proceed with the development, patenting, manufacture and marketing of the vacuum bottles and containers above referred to,"

I know the significance of the word "containers" as contained therein. They are containers like those of the patent in suit.

483 Mr. Millar: I offer this document in evidence as PLAINTIFF'S EXHIBIT 18.

Mr. Cromwell: I object to it as incompetent, irrelevant and immaterial and not connected with the issues of this cause.

The Court: Let it be received.

(Which said document, so offered and received in evidence was marked PLAINTIFF'S EXHIBIT 18, in words and figures as follows)

484 *Cross-Examination by Mr. Cromwell.*

This document which has just been offered in evidence as Plaintiff's Exhibit 18 is not the only document we have in our possession that relates to this relationship of Mr. Blair with our company. We have patent assignments from Mr. L. V. D. Blair. I believe these are the contracts that we had with reference to the inventions of L. V. D. Blair.

377 When Mr. Blair entered our employment Plaintiff's Exhibit 18 was not the expression of the terms
485 of his appointment. A verbal contract only expressed the terms of Mr. Blair's employment with our company. We had no written contracts with Mr. Blair.

At the time Mr. Blair developed this heat insulated receptacle in our employ, drawings may have been made

at that time. I am not sure. I have seen drawings. I don't know that the drawings were made at that time but the vessels themselves were made at that time. At the present time we haven't one of them vessels in our possession.

486 The last time I saw one of them heat insulated receptacles that was constructed in 1917, that Mr. Blair had anything to do with, was in the Federal Court in Chicago in the Monarch case. The date we had that case, when I saw that vessel, I think it was back about 1923 or 1924, the testimony in the case will show. I haven't seen that vessel since. It has been in the archives of the U. S. Federal Court here in Chicago. I don't know that the vessel is producible now. I don't know what happened to those exhibits. I haven't made any attempt to get hold of that vessel to produce it in this case as part of the records of this case. I don't know, I don't think our counsel has done so.

378 Q. You are testifying solely from memory, aren't you, after the lapse of about fifteen years as to what transpired back in 1917 and 1918 as to Mr. Blair's development.

A. I have a very distinct recollection of what occurred back there.

Q. But you haven't any record except this alleged

487 contract presented here as Plaintiff's Exhibit 18.

A. The contract is before me and it refreshes my mind as to the date.

Q. Will you examine that contract and say whether or not there is specifically mentioned anything there about heat insulated receptacles describing them as such?

A. It refers to the containers on the second page.

Q. That is merely the term "container."

A. Yes, sir.

Q. And doesn't describe it at all.

A. This letter refers very particularly to the rights of L. V. D. Blair.

Q. I am not talking about the rights, I am asking you to tell me whether or not that document describes the containers as such.

A. It does not describe any of these containers.

Mr. Cromwell: That is sufficient. That's all, your Honor.

379 Mr. Millar: That's all.

(Witness excused.)

Mr. Millar: That is our case, if the Court please.
The plaintiff here rested its case.
Mr. Cromwell: We have no sur rebuttal, your Honor.
(Discussion.)

380 IN THE UNITED STATES DISTRICT COURT. Certificate of Judge.
• • (Caption) • •

CERTIFICATE OF EVIDENCE.

It appearing that the within and foregoing statement of evidence was lodged with the clerk of this court on the 27th day of November, A. D. 1934, and that notice of such lodgment and of the time of the proposed settlement thereof and the filing of the praecipe was given to the attorneys for the defendant, Appellee, and it appearing that the said condensed narrative statement of the evidence is true, complete, properly prepared, and contains all of the testimony material to the hearing on appeal in said cause,

It Is Therefore Ordered that the same be setttled, ap-
381 proved and allowed as a true, complete, and correct statement of all the evidence in said cause reduced to narrative form (except such portions thereof as are, at the direction of the Court, reproduced in the exact words of the witnesses) and that the same be filed with the clerk of this court and become a part of the record on appeal.

Dated at Chicago, this 14th day of December, A. D. 1934.

JOHN P. BARNES
District Judge.

389 PLAINTIFF'S EXHIBIT 2.

IN THE UNITED STATES DISTRICT COURT,

Northern District of Ohio,

Eastern Division.

The Mantle Lamp Company of America,
Plaintiff,
vs.
The Geo. H. Bowman Company,
Defendant.
} In Equity. No. 2506.

Filed Jan. 18, 1928. B. C. Miller, Clerk, U. S. District Court, N. D. O.

BILL OF COMPLAINT.

To the Honorable, the Judges of the U. S. District Court, for the Northern District of Ohio, Eastern Division:

The Mantle Lamp Company of America, brings this, its Bill of Complaint against The Geo. H. Bowman Company and says:

(1) That the plaintiff, The Mantle Lamp Co. of America, is a corporation duly organized and existing under the laws of the State of Illinois and having its principal office and place of business at Chicago, in said state.

(2) That the defendant, The Geo. H. Bowman Company, is a corporation duly organized and existing under and by virtue of the laws of the State of Ohio and is a citizen and inhabitant of said state, with a place of business at Cleveland, Ohio, within the said Northern District of Ohio, Eastern Division, wherein it has committed the acts of infringement hereinafter complained of.

(3) That the jurisdiction of the court depends upon the Patent Laws of the United States.

390 (4) That heretofore, on, to-wit, October 29, 1919, Lewis Van Deventer Blair, a citizen of the United States residing at Chicago in the State of Illinois, was the first, true and original inventor of a certain new and useful improvement in Heat-Insulated Receptacles, not known or used in

this country, and not patented or described in any printed publication in this or any foreign country before his said invention or discovery thereof and not more than two years prior to his hereinafter recited application for a patent therefor and not in public use or on sale for more than two years prior to his hereinafter recited application for a patent therefor, and no application for a foreign patent for said invention was filed more than twelve months prior to the filing of the application in this country; and said invention was not abandoned to the public.

(5) That said Lewis Van Deventer Blair, being as aforesaid, the original, first and true inventor of said improvements, within the meaning of the Statutes of the United States then in force and being entitled to a patent thereon under the provisions of said statutes, did file in the United States Patent Office an application for Letters Patent on said invention and on the 14th day of November, 1922, all of the requirements of the Statutes of the United States then in force having been duly complied with, Letters Patent of the United States No. 1,435,199 were duly issued on said application to The Mantle Lamp Company of America, a corporation of Illinois, to whom the said invention and said application for Letters Patent thereon had previously been duly assigned by an instrument in writing, duly executed and delivered by said Lewis Van Deventer Blair, and recorded in the Patent Office of the United States.

391 (6) That the invention and improvements shown, described and claimed in said Letters Patent No. 1,435,199 are of great commercial value and practical utility and the public has generally acquiesced in the validity of said Letters Patent and has recognized the rights of this plaintiff in title in and under the same.

(7) That since the grant of the aforesaid Letters Patent, the plaintiff has continuously remained and now is the sole and exclusive owner thereof and of all rights and privileges thereunder and has been continuously engaged in the manufacture and sale of Heat-Insulated Receptacles embodying said patented improvements and has invested and expended a large sum of money in connection therewith and built up a large and profitable business therein and has reason to believe that it will continue to receive large profits and gains from said business if the infringement of said Letters Patent by the defendant be restrained as hereinafter prayed.

(8) That the defendant, well knowing the premises and

rights vested in this plaintiff and contriving to injure this plaintiff and to deprive it of the benefits and advantages which would otherwise have accrued to it from the use of said inventions and improvements, within the Northern District of Ohio, Eastern Division and elsewhere throughout the United States has, after the issuance of said Letters Patent and within six (6) years of the date of the commencement of this suit, without license or allowance from this plaintiff and against its will and in violation of its rights and in infringement of said Letters Patent, unlawfully and wrongfully made or caused to be made, used or caused to be used, sold or
392 caused to be sold, Heat-Insulated Receptacles made according to and embodying and containing the said invention and improvements aforesaid as set forth and claimed in said Letters Patent in violation of the rights of this plaintiff and to the damage and injury thereof.

(9) That the defendant and its agents and representatives, well knowing the premises, nevertheless still continued so to infringe said Letters Patent and threatens and proposes to continue the manufacture, sale and/or use of large numbers of Heat-Insulated Receptacles, all in infringement of said Letters Patent aforesaid and in defiance of the rights of and to the great and irreparable loss and injury of the plaintiff.

10. That the plaintiff has given to the public notice of the aforesaid Letters Patent and the plaintiff's rights thereunder, by marking the receptacles manufactured by it under said Letters Patent in accordance with the statute in such cases made and provided.

11. Forasmuch as plaintiff can have no adequate remedy, except in this court, and in a Court of Equity and to the end that the defendant may be required to account to the plaintiff for the gains and profits which it has derived from its aforesaid infringement of plaintiff's patent and may be restrained from any further infringement of said Letters Patent, the plaintiff prays:

(a) That the said defendant may be compelled by a decree of this court to account for and pay over to the plaintiff all the gains and profits that have arisen or accrued to, or have been obtained or received by the said defendant, or to
393 which the said defendant may be entitled by reason of its said unlawful manufacture, sale and/or use of devices embodying the invention and improvements described and claimed in Letters Patent 1,435,199, and also all damages

which this plaintiff has sustained and shall or may sustain by reason of the aforesaid infringement by said defendant.

(b) That a writ of injunction issue out of and under the seal of this court, permanently enjoining and restraining the said defendant, its officers, directors, agents, servants and employees and each of them, from any further infringement of said Letters Patent No. 1,435,199.

(c) That the said defendant may be decreed to pay the costs and disbursements of this suit.

(d) That a writ of subpoena may be issued under the seal of this court, directed to the above named defendant, The Geo. H. Bowman Company, a corporation, commanding it to appear and answer this Bill of Complaint, but not under oath, the answer under oath being hereby expressly waived.

(e) That such other and further relief be accorded the complainant herein as to the court may seem just and proper.

THE MANTLE LAMP CO. OF AMERICA,
By VICTOR S. JOHNSON,
President.

State of Illinois } ss.
County of Cook. }

Before me, the undersigned, a Notary Public in and
394 for the County and State aforesaid, this 14th day of January, 1928, personally appeared Victor S. Johnson, and made oath that he is President of The Mantle Lamp Co. of America, the plaintiff named in the foregoing bill; that he has read the said bill, knows the contents thereof and that the same is true as he verily believes; that he subscribed to the foregoing bill and that he had authority so to do.

Witness my hand and notarial seal, the day and year aforesaid.

META SCHMIDT,
Notary Public.

(Seal)

THOMAS G. STEWART,
Solicitors for Plaintiff.

395 United States District Court } ss:
Northern District of Ohio }

I, F. J. Denzler, Clerk of the District Court of the United States within and for said District, do hereby certify the foregoing to be a true copy of the Bill of Complaint filed in

the above-entitled cause in said Court, and that the same is correctly copied from the original now on file in my office.

Witness my official signature, and the seal of said Court at Cleveland, in said District, this 12th day of September, A. D. 1933, and in the 158th year of the Independence of the United States of America.

F. J. DENZLER,
Clerk.

(Seal)

By FLORENCE YOUNGBERG,
Deputy Clerk.

396 PLAINTIFF'S EXHIBIT 3.

No. 5606.

UNITED STATES CIRCUIT COURT OF APPEALS,

Sixth Circuit.

Mantle Lamp Company of America, *Appellant,*
vs.
Geo. H. Bowman Company, *Appellee.*

Appeal from the District Court for the Northern District of Ohio.

Decided November 3, 1931.

Filed Nov. 3, 1931, John W. Menzies, Clerk.

Before DENISON and MOORMAN, *Circuit Judges,* and SIMONS, *District Judge.*

DENISON, *Circuit Judge:* This is the usual patent infringement suit, based upon the Blair patent, No. 1,435,199, of November 14, 1922, for a "heat insulated receptacle." It discloses the type now common on the market, which comprises a large mouthed receptacle, holding a gallon or more, insulated within an outer casing which is in the general form of a pail or a large bottle, and which efficiently keeps a substantial amount of food or drink hot or cold for several

hours. The patent was sustained in the Monarch and the McComb cases, in the Northern District of Illinois (unreported), but these decrees were reversed by the Seventh C. C. A., (22 Fed. [2d], 93. 95), and the patent was held to be lacking in invention.

In the present case, the defendant filed an answer, relying upon the former decision and setting up a long list of earlier patents. It did not take proofs and did not appear at the final hearing in the court below. The plaintiff voluntarily put in evidence all the patents set up in the answer. The District Judge felt obliged to follow the earlier decision, and dismissed the bill. Upon this appeal the defendant did not appear; and we accept the assurance of plaintiff's counsel that they knew of no reason for defendant's default except lack of sufficient pecuniary interest. At our suggestion, we have been furnished with copies of the records and of the briefs in the former cases, and have thus been quite fully informed as to the proofs and the contentions therein.

The modern art of efficient insulated receptacles for domestic use seems to have been begun about 1907, with the now very familiar thermos bottle, and with similar structures known as "icy-hot," or by other names. These comprised a double wall of glass with an intervening vacuum; from necessities of manufacture they were very delicate and fragile; and they had usually no greater capacity than one quart, though a two-quart size was made to some extent. Beginning about 1907, this vacuum type for keeping liquids hot or cold, became exceedingly popular. The invention now involved was put upon the market about 1918, under the trade name "Aladdin." It comprised a much larger receptacle, holding from one up to three or four gallons, and, by reason of its size and permissible large neck, was adapted to keep hot or cold not only liquids but solid or semi-solid food. It was well received and had large and increasing sales. Within a short time, it and similar articles made by others, and which are said to be infringements, had established their position as practically a new article of manufacture, and plaintiff was far and away the leader in the sales. Up until the proofs were taken it had sold over one million of them.

What Blair did, in substance, was to depart from the vacuum type; to rely for his heat insulation upon a relatively non-conducting packing between his outer and inner walls; to use an outer casing made of metal, which would be strong enough to receive ordinary shocks, and an inner container made of glass or some vitreous material that would

allow the minimum of heat to escape therefrom; and to unite the outer and inner casings at their upper or neck ends, so that the inner would be pendently supported by the outer and so that the uniting means or bond should also serve as an insulator against heat or cold and as a seal to exclude air or moisture from the packing material. He was thereby enabled to, and, was the first who did, put on the market a strong and satisfactorily efficient portable insulated jar or can, of relatively large size. There was, of course, nothing new in having merely the outer and inner vessels, with a packing between; but both the face of the patent and a
397 review of the prior art and the oral testimony, indicate that Blair's useful novelty, which is incorporated in several of the claims, and which we take to be the dominant characteristic of his invention, consisted in hanging the inner container to the outer shell at the upper extremity of each by a bond which was sufficient for this supporting function and which also served the essential insulating and sealing purposes. He was thus enabled to avoid relying upon the packing material for supporting the inner container from below—a function which it could only imperfectly perform, —and to avoid any extensive contact between the inner receptacle and the outer casing, whereby there would be any substantial channel for the escape of heat. Obviously, the use of a bonding material between the two instead of having any mechanical direct union, gave opportunity for interposing a comparatively non-conducting material. So far as the record indicates, there is no material used by the plaintiff or by infringers, which is suitable for this bond, which is not also, in considerable degree, heat insulating.

Claim 1 is given in the note,[1] and is sufficient to indicate the limits of the controversy. For the outer and inner containers, the parties have not used any materials other than metal for the outer and a vitreous or glass-like material for the inner. There is nothing to show that the more generic terms, non-frangible and frangible, have practically any wider application which might extend the field of prior use. The claim may, therefore, as well be read as if it called for containers that were respectively metallic and glassy.

[1] A heat-insulated vessel of the non-vacuum type, having an outer jacket of non-frangible material, an inner container of frangible material, said inner container being bonded to and pendently supported from said jacket, and heat-insulating and shock-absorbing means surrounding said container for limiting oscillations of said container while permitting expansion thereof by changes of temperature.

The record leaves no doubt that Blair's combination was new, and its utility is demonstrated by the large sales and the adoption by infringers. The argument against validity is that all the elements were old and there was no invention in putting them together. The earlier existence of the elements must be conceded; outer metallic casings used with an inner glass receptacle and with interposed insulating packing were old; metal and glass had been bonded together for some purposes and to some extent by material which would adhere to each; and an inner receptacle of bottle shape had been hung by its neck from the indrawn neck of an outer casing through mechanical direct contact. All these constructions had defects which apparently had prevented them, —something had,—from going into general use. The packing interposed between the outer and inner parts was certain to become, with use, somewhat denser and to leave the inner imperfectly supported and subject to jar and breakage. If the inner receptacle had its neck extended out so that it would rest upon the outer casing, and might, e. g., be soldered thereto, a path was given for the escape of heat. By adopting the plan of pendent support, Blair insured against failure of the interposed packing to support sufficiently, and by effecting this support by a bond between the two, rather than by a mechanical union, and by using for the bond this described material, or any other which has been found effective for that purpose, he at the same time gave support, prevented the escape of heat and sealed out the air and moisture from the packing. Further, this method of bond support was mechanically more efficient and satisfactory than the other methods which had been tried.

The substantial character of Blair's step and its non-obviousness, are demonstrated by the testimony. The manager of a leading manufacturer of bottles of the thermos or vacuum type, testifies that when they realized the demand for larger receptacles, they tried to enlarge their thermos bottle, the "icy-hot," using its method of manufacture, and they found it impossible. The mechanical difficulties of handling hot glass in the manufacturing process, so as to produce a large and heavy receptacle, were insuperable. Thereupon, in the endeavor to make an article to compete with the Aladdin, then on the market, without adopting the pendent-bond-support, they tried the best plan they knew. They inserted between the two bottoms supporting springs, which would hold the upper one against vibration and compensate for any settling in the packing; but when they pro-

duced this article for the market, they found the best they could do was to maintain the temperature three or four hours, as against six or eight for the Aladdin. The manager says that for his own use he discarded his own and bought an Alladin. The attempt to market this article was abandoned.

The manager at the time, of the McComb Company, one of Blair's chief early competitors and defendant in one of the Illinois cases, testifies in this record. The McComb Company began to make this non-vacuum type in 1921. (the Blair patent application was filed in 1919) and sold about 1500 of its devices, which had an earthenware container sup-
398 ported at the neck by the indrawn neck of the metallic casing. There was no bond or seal,—at least, not in any effective way. This form did not satisfy the market, after one season's trial it was abandoned and Blair's pendent-bond-support adopted.

The record in the Monarch case contains, in our view, most persuasive evidence that Blair's advance step was not one obvious to those skilled in this art. The Monarch Company was engaged for two or three years in the effort to make a satisfactory article to meet the need for a larger and stronger "thermos bottle." Its mechanics,—certainly skilled,—tried several different forms, marketed some, abandoned them, and eventually came to and adopted Blair's pendent-bond-support form, a year or more after the Aladdin was on the market. A summary of this evidence is in the note.[2]

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[2] In 1918 the Monarch Company began its attempt to develop the non-vacuum type so as to get a relatively large container. It was without knowledge of Blair's idea. It used an ordinary Mason jar, packed in a casing with interposed insulation and with a metal tube for filling and emptying, extended from the jar cover up through the open top of the outer container and soldered thereto. There was thus (perhaps) the pendent support, but no combination of metal and glass, by such a bond or support by that bond, as Blair provided, and there was an obvious metallic channel for heat escape. About the same time the Monarch people made a second form, using an earthenware container with a neck and a metallic outer jacket conically drawn in at its neck and closely surrounding the projecting earthenware neck, but there was no attempt at insulation at this point between the two, or support of one by the other, but for this support the interposed packing material was relied upon. As this could not maintain resilience, the structure was certain to be inefficient as well as heat conveying. They planned to manufacture this on a large scale, but very soon discarded it. About July, 1918, they tried a third form, upon which, in December, they filed an application for a patent (later abandoned). This was like the second form just described, except that spring supports were interposed between the two bottoms to hold the inner container up in position (like the trial form experimentally produced by the "icy-hot"). This could hardly be satisfactory; the springs could not hold the inner jar motionless, there was no bond or seal at the necks, moisture and air would enter the packing material and both the direct con-

We thus find that in accomplishing this combination of old elements to make a new market article, there had been not only the delay of thirty or more years since the old patents now said sufficiently to teach the combination, (though during most of this period there was no foreseen public demand for a thing of this kind), but there had been, after the demand was known, two or three years of effort by Blair's competitors to satisfy it by using their best skill in various combinations other than his, and we see that eventually one of them dropped out and the other two were compelled to use Blair's system of bond support for the pendent inner container. Seldom is there a record of failure by other things and success by the patented means, more helpful than this is, upon the issue of invention.

We do not overlook the problem presented by the form of the claim. The functions of the bonding material, as an insulator to interrupt the flow of heat and as a seal to exclude air and moisture from the packing, are not specified in the claim, although they are of considerable importance, (we do not say vital), in distinguishing from the prior art. We think this patent is entitled to a fairly liberal construction in aid of its validity and ought not to be defeated by any unnecessary adherence to technical rules. We think also that the always implied "substantially as described" and the doctrine of interpretation by the specifications, justify regarding

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tact of the two necks and the lower springs would make troublesome heat conveyers. In March, 1919, they filed another patent application on a fourth and slightly different form. It lacked springs, but it had the other recited defects. They had not felt justified in trying to market any of these four forms. A fifth form, adopted October, 1919, was put upon the market. This was like numbers 3 and 4, except that they endeavored to avoid the heat escape at the contact point of the two necks by interposing a rubber gasket. There was no suggestion of bond or pendent support. There was a form of sealing by this gasket, but nothing to compel contact so as to make the seal effective. During 1919 and 1920, they marketed some 7000 jugs of this type, of which nearly half were returned as unsatisfactory. In the fall of 1920, they substituted for number 6, form number 7. This was an elaboration of the rubber gasket idea. In addition, the inner jar was pendently supported at the neck by a screw thread engagement with the cap which was in contact with the outer container. Here again there was a heat losing contact between the inner and outer parts, and nothing resembling a supporting insulating bond between the two. As a sealing means, the rubber gasket was inefficient because it would be released whenever the cap was taken off. They manufactured and sold this form with some success for two years. Just at what time they had knowledge of the Blair construction does not appear, but in 1932, they abandoned number 7 and adopted the Blair idea of pendent-bond-support. They discarded their rubber gasket seal and separable two part form of the outer casing; they abandoned direct contact between the two necks, enlarged the outer one so as to get an intermediate space, and filled this in with a composition which was both bond and seal and which caused the inner to be pendently supported by and from the outer.

the "bond" of the claim as one which does effectively insulate the outer and inner members. The patent specifies, in line 61 of page 1, that the bonding substance shall be of low heat conductivity, and the succeeding lines emphasize that it is to be incapable of transferring much heat or cold from one to the other. Its "non-heat transmitting properties" are again emphasized in line 115 of page 2. To import this limitation into the claim is not to bring in an additional element. It is only to interpret with the aid of the specification one of the words of the claim, so that it may not be thought so broad as to be destructive.

How far the sealing quality should also be implied in the claim in aid of its validity, it does not seem necessary to decide. Nor need we decide just what would or
399 would not be the supporting bond contemplated by the claim. In defendant's form, the material of the bond is a sulphur composition. It is strongly adherent, both to glass and metal. It seems probable that it would, unaided, sufficiently support the pendent receptacle; but its operation is aided by providing grooves in the outer surface of the inner and the inner surface of the outer necks into which grooves the bonding composition enters, and which grooves therefore aid in preventing any slippage as between the two members. This construction renders it less vital that the bonding material should adhere efficiently to smooth glass and smooth metal, as shown in the structure of the patent drawings; but the testimony of the experts that there is infringement is not disputed, we have no argument on the subject, and we think, for the purposes of this record, we should find that infringement exists.

The Seventh Circuit Court of Appeals relied upon three old patents as the most pertinent out of the many cited by defendant in that case, and expressed the view that in selecting elements from these three and combining them, as Blair did, there was no invention. Even if this were a case where the lack of invention could be spelled out in this way, the patents do not seem to us sufficient for that result. Clisbee No. 358,732, March 1, 1887, relates to a double wall metallic can for keeping coffee hot. The inner can is pendently supported by an upturned flange on its neck resting against the indrawn collar of the outer can, and the parts are screw-clamped together. There is no suggestion of bond or seal. The loss of heat from the direct contact of the two metal parts is obvious. The other two patents relied upon (Heath, No. 211,092, January 7, 1879, and Fox, No. 438,149, October

14, 1890) do not relate at all to heat insulation. They consist essentially of packing boxes to prevent the enclosed bottle from being broken in transportation. They do not have, in an effective sense, any bond or seal. Fox shows a wooden packing case, for transporting a glass carboy. He furnishes support apparently only from below by an interposed packing. It is true that between the neck of the carboy and the surrounding hole in the top of the wooden box, Fox puts in plaster of Paris and says that it is "to exclude water or moisture." There was thus the thought of a seal, but the proof is that plaster of Paris alone does not effectively exclude air or moisture, and that it would not adhere to the wood and glass so as to support the heavy carboy. It never was intended to give pendent support. Heath, likewise, who has only a bottle cased for shipping, and whose entire stated object was to prevent breakage, has no pendent support and no bond or seal.

The leading decisions on the subject of invention are too familiar for citation. Their application depends on the facts of each case. We are constrained to the other conclusion from that reached by the Seventh Circuit Court of Appeals. It may well be noted that the testimony of two competitors, showing their unsuccessful efforts to get Blair's result by other means, was not in these McComb and Monarch records, and this proof is so important that it alone goes far toward justifying a different result here.

We have considered only claim 1. There are other claims which are broader in some respects and do not incorporate the supporting bond. They thus present questions of validity which we have not discussed. Some other claims are narrower and suggest questions of infringement. We see no object, upon this record, in considering any of these claims.

The decree will be reversed and the case remanded, with instructions to enter the usual decree for plaintiff on claim 1, and without prejudice to any rights of the plaintiff under any other claim.

September 11, 1935.

A true copy.

Attest:

J. W. MENZIES,

(Seal) *Clerk, U. S. C. C. A., Sixth Circuit.*

400 PLAINTIFF'S EXHIBIT 4.

IN THE UNITED STATES DISTRICT COURT,

Northern District of Ohio,

Eastern Division.

The Mantle Lamp Co. of America, *Plaintiff,*
vs.
The Geo. H. Bowman Company, *Defendant.*
} In Equity, No. 2506.

ANSWER.

Filed Mar. 13, 1934. Charles M. Bates, Clerk.

Filed Mar. 24, 1928. B. C. Miller, Clerk, U. S. District Court, N. D. O.

To the Honorable, The Judges of the U. S. District Court, for the Northern District of Ohio, Eastern Division:

The defendant, The Geo. H. Bowman Company, for answer to the bill of complaint brought by the plaintiff says:

1. That the defendant is without knowledge that the plaintiff is a corporation duly organized and existing under the laws of the State of Illinois and has its principal office and place of business at Chicago, Illinois, and therefore leaves plaintiff to its proof.

2. That the defendant admits that it is a corporation duly organized and existing under and by virtue of the laws of the State of Ohio and has a place of business at Cleveland, Ohio, but defendant denies that it has committed any acts of infringement relating to plaintiff within the Northern District of Ohio, Eastern Division, of the U. S. District Court.

3. That the defendant admits that the jurisdiction of 401 said court depends upon the Patent Laws of the United States.

4. That the defendant denies that on October 29, 1919, Lewis Van Deventer Blair, of Chicago, Illinois was the first, true and original inventor of a certain new and useful improvement in Heat-Insulated Receptacles; and further denies that said invention had not been patented or described

in any printed publication in this or any foreign country before his invention or discovery thereof and not more than two years prior to his hereinafter recited application for a patent therefor, and not in public use or on sale for more than two years prior to said application, and that said invention was not abandoned to the public.

Defendant is without knowledge and therefore denies that no application for a foreign patent for said invention was filed more than twelve months prior to the filing of the application in this country.

5. That the defendant denies that the said Lewis Van Deventer Blair was the original, first and true inventor of said improvements within the meaning of the Statutes of the United States then in force, and denies that he was entitled to a patent thereon under the provisions of said statutes.

That defendant admits that an application for Letters Patent on said invention was filed in the U. S. Patent Office and that on the 14th day of November, 1922, Letters Patent No. 1,435,199 were issued and that the Mantle Lamp Co. of America was the assignee, but defendant is without knowledge and denies that all of the requirements of the Statutes of the United States then in force were duly complied with.

402 6. That the defendant admits that the invention and improvements shown, described and claimed in said Letters Patent No. 1,435,199 are of great commercial value and practical utility, but that the defendant denies that the public has generally acquiesced in the validity of said Letters Patent and has recognized the rights of the plaintiff in title in and under the same, and makes reference to the case of *Macomb Manufacturing Co.* v. *Mantle Lamp Co. of America*, 22 F (2d) 93, and to the case of *Monarch Co. Inc.* and *Therm-A-Jug Company, Inc.* v. *Mantle Lamp Company of America*, 22 F (2d) 95, in both of which the United States Circuit Court of Appeals, Seventh Circuit, has handed down its decisions as to the invalidity of the Patent No. 1,435,199.

7. That the defendant is without knowledge and therefore denies that since the grant of the aforesaid Letters Patent, the plaintiff has continuously remained and now is the sole and exclusive owner thereof and of all rights and privileges thereunder and has been continuously engaged in the manufacture and sale of Heat-Insulated Receptacles embodying said patented improvements and has invested and expended a large sum of money in connection therewith and built up a large and profitable business therein and has rea-

son to believe that plaintiff would continue said profitable business if the alleged infringement be restrained.

8. That the defendant denies contriving to injure the plaintiff and to deprive it of any benefits and advantages that would have accrued to it from the use of said inventions and improvement either within the Eastern Division of the Northern District of Ohio or elsewhere throughout the United States, and defendant further denies that it has after
403 the issuance of said Letters Patent and within six years of the date of commencement of this suit, without license or allowance from the plaintiff and against its will and in violation of plaintiff's rights and in infringement of said Letters Patent, unlawfully and wrongfully made or caused to be made, used or caused to be used, sold or caused to be sold, Heat-Insulated Receptacles made according to and embodying and containing the said invention and improvements aforesaid as set forth and claimed in said Letters Patent in any violation whatsoever of the rights of the plaintiff and to the damage and injury thereof.

9. That the defendant denies that it or its agents did or now continue to infringe said Letters Patent and threatens and proposes to continue the manufacture sale and use of large numbers of Heat-Insulated Receptacles which infringe in any way said Letters Patent in defiance of rights of and to the great and irreparable loss and injury of the plaintiff.

10. That the defendant is without knowledge and therefore denies that the plaintiff has given to the public notice of the aforesaid Letters Patent by marking the receptacles manufactured by plaintiff under said Letters Patent in accordance with the statute in such cases made and provided.

11. That the defendant avers upon information and belief that the claims in the said Letters Patent No. 1,435,199 to Blair, dated November 14, 1922, are each and all invalid, void and of no effect in law because of the alleged invention and improvement claimed to be therein described, disclosed and claimed had been, long prior to the alleged invention or discovery thereof by the said Blair, and more than two years prior to his alleged application, described and fully disclosed to the public and patented in various patents and printed
404 publications in the United States and foreign countries, and that said Blair was not the original, first and true inventor or discoverer thereof, or of any material or substantial part of the alleged invention and improvement claimed to be patented in said patent, but that the same had been in public use and on sale in the United States for more

than two years prior to said Blair's alleged application and each and every part thereof, had been invented and discovered and used by and known to others in the United States before the alleged invention or discovery thereof by the said Blair and said alleged invention and improvement had been abandoned to the public, and that said alleged invention and improvement had been made known, described and illustrated in numerous prior patents and printed publications, as follows:

United States Patents.

Number	Date	Patentee
147,459	Feb. 10, 1874	F. W. Wiesebrook
211,092	Jan. 7, 1879	Eugene A. Heath
438,149	Oct. 14, 1890	J. W. Fox
884,582	Apr. 14, 1908	H. Henn
900,075	Oct. 6, 1908	G. P. Altenberg
916,814	Mar. 30, 1909	D. A. Williams
922,174	May 18, 1909	J. G. Lyman
1,000,172	Aug. 8, 1911	J. S. Hopkins
1,067,072	July 8, 1913	L. R. Steel
1,333,795	Mar. 16, 1920	C. W. Davis, *et al*
1,362,740	Dec. 21, 1920	W. B. Rood, *et al*
46,640	Mar. 7, 1865	M. M. Clark
184,256	Nov. 14, 1876	J. C. Moore
358,732	Mar. 1, 1887	C. E. Clisbee
1,071,817	Sept. 2, 1913	W. Stanley
1,199,772	Oct. 3, 1916	J. J. Engle
1,309,967	July 15, 1919	W. W. Simonson, *et al*
1,497,764	June 17, 1924	W. W. Simonson, *et al*

French Patents.

380,824	Dec. 18, 1907	G. P. Van Wye
403,574	Nov. 8, 1909	Societe Primas Gesellschaft Ritzhaupt & Co.
411,568	June 20, 1910	J. Lodo, *et al*
403,572	Nov. 8, 1909	P. L. B. Marchet

405

British Patent.

835	1881	E. J. Gaskell, *et al*

Publication.

Knight's American Mechanical Dictionary, published by J. B. Ford and Company, New York, U. S. A., in 1874, page 507.

12. That the defendant denies that the said alleged invention and improvement were or are the lawful subject of Letters Patent under the statutes of the United States and avers that the same did not constitute a patentable invention and was not the result of the exercise of the inventive faculty and that the same involved nothing more, if anything, than the exercise of mere mechanical skill over the then existing art, and, therefore, each and every of said claims are void.

13. That the defendant denies that plaintiff is entitled to any of the relief sought and prayed for in paragraph 11 of plaintiffs' bill of complaint, denying any right to an accounting, profits, damages, injunction, and costs, or any part thereof, or to any other relief against this defendant, and prays that the bill of complaint be dismissed with costs.

THE GEO. H. BOWMAN COMPANY,
By C. T. BROOKS
Secretary.

JOSEPH A. MINTURN
HERBERT A. MINTURN
Solicitors and of counsel for Defendant.

406 United States District Court } ss:
Northern District of Ohio }

I, F. J. Denzler Clerk of the District Court of the United States within and for said District, do hereby certify the foregoing to be a true copy of the Answer filed in the above cause in said Court, and that the same is correctly copied from the original now on file in my office.

Witness my official signature, and the seal of said Court at Cleveland, in said District, this 12th day of September, A. D. 1933, and in the 158th year of the Independence of the United States of America.

F. J. DENZLER,
Clerk.
By FLORENCE YOUNGLERY,
Deputy Clerk.
(Seal)

(Endorsed) Certified Copy of Cover No. 2506. Equity. United States District Court Northern District of Ohio Eastern Division The Mantle Lamp Co. of America *vs.* The Geo. H. Bowman Company Certified Copy of Answer Filed and entered March 24, 1928 F. J. Denzler, Clerk.

407 PLAINTIFF'S EXHIBIT 5.

Term Headings

Filed Mar 13 1934.

DISTRICT COURT OF THE UNITED STATES

Northern District of Ohio

Eastern Division

At a stated term of the District Court of the United States, within and for the Eastern Division of the Northern District of Ohio, begun and held at the City of Cleveland, in said District, on first Tuesday in April, being the 5th day of said month, in the year of our Lord one thousand nine hundred and thirty-two, and of the Independence of the United States of America, the one hundred and fifty-sixth, to-wit: On Tuesday, the 10th day of May, A. D. 1932.

Present:

Honorable S. H. West, United States District Judge.

Among the proceedings then and there had were the following, to-wit:

408 IN THE DISTRICT COURT OF THE UNITED STATES,

Northern District of Ohio,

Eastern Division.

The Mantle Lamp Company of America,
Plaintiff,
vs.
The Geo. H. Bowman Company,
Defendant.
} In Equity. No. 2506

DECREE UNDER MANDATE.

Filed May 10 1932

F. J. Denzler, Clerk,

U. S. District Court, N. D. O.

Upon application of counsel for plaintiff It Is Hereby Ordered that the mandate herein of the United States Circuit Court of Appeals for the Sixth Circuit be filed in this court.

It Is Ordered, Adjudged and Decreed as follows:

1. That the bill of complaint be and the same is hereby sustained.

2. That the Letters Patent in suit of the plaintiff, The Mantle Lamp Company of America, being United States Letters Patent No. 1435199, dated November 14, 1922 for Heat Insulated Receptacle, said Letters Patent having been granted to The Mantle Lamp Company of America of Chicago, Illinois, assignee of Lewis Van Deventer Blair of Chicago, Illinois, are good and valid in law as to claim one (1) and without prejudice to any rights of the plaintiff under any other claim.

409 3. That the Mantle Lamp Company of America, a corporation organized and existing under and by virtue of the laws of the State of Illinois, is the owner of the said United States Letters Patent No. 1435199 and of all rights thereunder, as alleged in plaintiff's bill of complaint herein, and is entitled to the exculsive rights in and to and under said Letters Patent and in and to the invention and improvements secured thereby.

4. That the defendant herein, The Geo. N. Bowman Com-

pany, has infringed claim one (1) of said United States Letters Patent No. 1,435,199.

5. That the plaintiff, The Mantle Lamp Company of America, do recover of the defendant, The Geo. H. Bowman Company, the profits, gains and savings which the defendant has derived, received or made since the 18th day of January 1928, by reason of the infringement of the exclusive rights under said claim under said patent by any manufacture, use or sale of heat insulated receptacles containing and embodying the improvements described in the said claim of said Letters Patent and covered by the said claim of said Letters Patent, and that the plaintiff, The Mantle Lamp Company of America, do recover of said defendant, The Geo. H. Bowman Company, any and all damages which the said plaintiff, The Mantle Lamp Company of America, has sustained since the 18th day of January, 1928, by reason of such infringement of its exclusive rights by the said defendant, The Geo. H. Bowman Company, and this cause is hereby referred to C. D. Friebolin Master of this Court, who is hereby appointed to take, ascertain and state the number of infringing devices or parts thereof made and the number sold by the defendant in infringement of said claim one (1) of said Letters Pat-
410 ent and the number of such infringing devices or parts thereof which the said defendant has on hand, and the gains, profits and savings derived by the said defendant from and through said infringement, and to assess the damages thereby suffered by the said plaintiff, The Mantle Lamp Company of America, and to report thereon to this court with all convenient speed, and the said defendant, The Geo. H. Bowman Company, its officers, agents, attorneys, clerks, servants, workmen, and employees of the said defendant, are hereby directed and required to attend before the said Master, from time to time, as required by him and to produce before him such books, papers, statements, exhibits, vouchers, and documents as they may be directed by said Master to produce and to submit to such or other examination as the Master may direct.

6. That a perpetual injunction issue out of and under the seal of this court directed to the said The Geo. H. Bowman Company and to the officers, agents, representatives, attorneys, clerks, servants, workmen, and employees of it, enjoining and restraining them and each of them from directly or indirectly making or causing to be made, using or causing to be used, advertising for sale, vending or causing to be sold in

any manner any articles, devices or parts thereof containing, employing or embodying the said invention and improvements described in said Letters Patent No. 1,435,199 and covered by said claim one (1) thereof and from infringing upon or violating the said Letters Patent and the said claim thereof in any way whatsoever.

7. That the plaintiff, The Mantle Lamp Company of America, do recover of the said defendant, The Geo. H.
411 Bowman Company, the costs of this suit to be taxed and the consideration of increase of damages be reserved until the coming in of the Master's report.

S. H. WEST,
Judge of the District Court of the United States.

412 DISTRICT COURT OF THE UNITED STATES OF AMERICA

Northern District of Ohio

Eastern Division

I, F. J. Denzler, Clerk of the District Court of the United States within and for said District, do hereby certify that I have compared the within and foregoing transcript with the original Decree Under Mandate entered upon the Journal of the proceedings of said Court in the therein-entitled cause, at the term and on the day therein named, and do further certify that the same is a true, full, and complete transcript and copy thereof.

Witness my official signature, and the seal of said Court at Cleveland, in said District, this 12th day of September, A. D. 1933, and the 158th year of the Independence of the United States of America.

F. J. DENZLER,
Clerk.

(Seal)

By FLORENCE YOUNGBERG,
Deputy Clerk.

Endorsed: Certified Copy Cover No. 2506. Equity. United States District Court Northern District of Ohio Eastern Division The Mantle Lamp Company of America vs. The Geo. H. Bowman Company Certified Copy of Decree Under Mandate Filed and entered May 10 1932 F. J. Denzler, Clerk.

Plaintiff's Exhibit 7

Plaintiff's Exhibit 7

CARSON PIRIE SCOTT & Co.

MANUFACTURERS - IMPORTERS - WHOLESALE DISTRIBUTORS

KEEP FULLY INSURED

DRY GOODS

366 WEST ADAMS STREET
CHICAGO

TELEPHONE
FRANKLIN 6600

Pl. Ex 7

JULY 9TH 1932

ALADDIN INDUSTRIES

609 W LAKE STR CHICAGO ILL

This merchandise F. O. B. point of shipment.
No allowances will be made on goods damaged in transit.
All claims for deficiencies must be made immediately after receipt of goods.
When goods are purchased by selection or shipped according to order, they must not be returned.

Payable in Chicago or New York Exchange

Invoice and Package No. 539371 Terms 2% PASS 19023 Per Cent 10 Days, Net Cash 60 Days—Subject to Sight Draft Thereafter
Interest will be Charged after Maturity on Bills Remaining Unpaid.

LOT NO.	DESCRIPTION	QUANTITY	PRICE	EXTENSION	AMOUNT
0350	JUG Mfgd by Aluminum Products Co Kalamazoo, Mich	1	1 80		1 80
					04
					1 76

PAID
JUL 13 1932
CARSON PIRIE SCOTT & CO

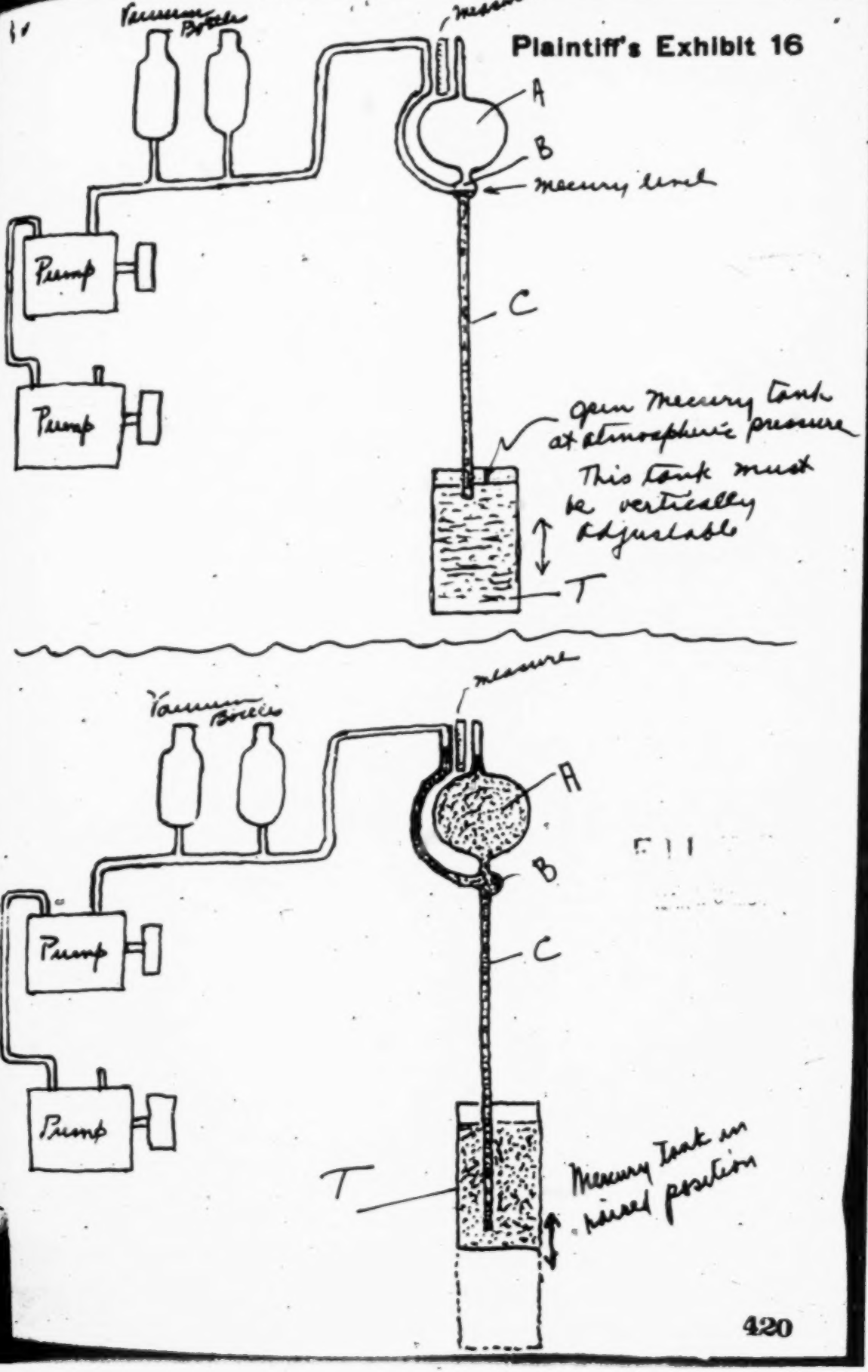
IN CHECKING THIS BILL, OPEN EVERY PAPER BOX, AS IT IS OFTEN CONVENIENT TO PACK SEVERAL ARTICLES OF A DIFFERENT DESCRIPTION UNDER A COVER DESIGNED FOR ONE

Plaintiff's Exhibit 8

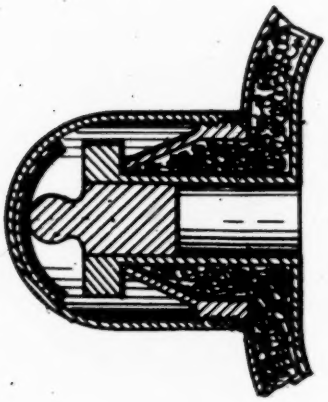
FILED
MAR 13 1934

A Breech
B Blast
C Container

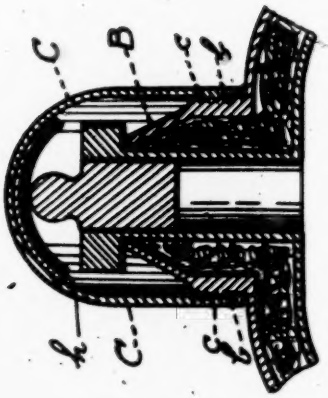
Plaintiff's Exhibit 16



Plaintiff's Exhibit 16a



B



A

425 PLAINTIFF'S EXHIBIT 18.

December 29th, 1917.

To—
August Herrmann,
August J. Henkel,
M. F. Roebling,
John W. Sullivan,
Ida Mai Bultman,
Charles E. Bultman,
Lee Hirschler,
Ben Hirschler,
John A. Stewart,
W. W. Simondson,

Gentlemen:

Referring to the letter of the Mantle Lamp Company of America, dated Chicago, Ill., December 22nd, 1917, addressed to you, it is understood that after January 1st, 1919 the Mantle Lamp Company of America guarantees to pay to you a minimum compensation of two thousand ($2000.00) dollars per year, and in the event of its failure to pay said compensation it will convey to you all rights in the improvements, inventions and patents, subject to the restrictions for the payment of compensation set forth in said letter of December 22nd, 1917, provided, however, that if said patents are not granted or are interfered with, or are successfully attacked, as mentioned in said letter of December 22nd, 1917, then the obligation to pay the said minimum compensation shall cease and the patents shall be re-assigned.

It appearing that there may be some ambiguity in the first paragraph of our letter to you of December 22nd in relation to the rights, patents and applications for patents, which you are to assign to us, we beg to say that we did not intend by the language used in said letter to impose upon you any obligation to make further applications for or procure further patents.

Yours respectfully,
THE MANTLE LAMP CO. OF AMERICA,
By VICTOR S. JOHNSON,
Pres.

Filed Mar. 13, 1934, Charles M. Bates, Clerk.

426 (Letterhead of The Mantle Lamp Company of America, Incorporated.)

Chicago, Illinois
December 22, 1917

To—
August Herrmann,
August J. Henkel,
M. F. Roebling,
John W. Sullivan,
Ida Mai Bultman,
Chas. E. Bultman,
Lee Hirschler,
Ben Hirschler,
John A. Stewart,
W. W. Simonson.

This Company makes you the following proposition with reference to improvements made and being made in vacuum bottles, vacuum containers, seals, sealing compositions and sealing devices, and also improvements and inventions known as "Ke-lo Vacuum Bottle", you to secure and deliver to The Mantle Lamp Company of America full and complete title to all rights, patents, applications for patents for the United States and all other countries and territories in the world, which assignment shall give The Mantle Lamp Company of America full title to all the rights and applications of the inventor, owner or parties interested in any way in and to said improvements, including all rights of L. D. V. Blair, William F. Siminson, Charles E. Bultman and the Keep Longer Company.

You are also to deliver full title and possession of to The Mantle Lamp Company of America of all formulas, experimental data, information, records and equipment, which have been worked out, created, made or used in connection with said inventions and improvements.

The Mantle Lamp Company of America is to be put in possession by you of all necessary assignments and documents to vest in The Mantle Lamp Company of America all of the rights herein mentioned, it being understood that the obligation of The Mantle Lamp Company of America to make the payments herein provided to be made shall depend upon issuance and validity of the patents contemplated in connection with the above mentioned improvements and inventions. It being understood that if the monopoly of The Mantle Lamp Company of America in the practice of said patents and the manufacturing, developing and selling of said inventions is successfully attacked or interfered with by other parties, that

its liability to make the payments provided to be made shall cease.

427 Under the foregoing conditions, The Mantle Lamp Company of America agrees to proceed with the development, patenting, manufacture and marketing of the vacuum bottles and containers above referred to, and agrees to pay to you collectively five cents (5c) per bottle or container, on all sales made by it; settlement to be made quarterly and you to have the right of inspection of the books of The Mantle Lamp Company of America, once each month, by some one person designated by you for that purpose, it being understood that you are to designate someone to whom the payment of the compensation heretofore referred to may be made, which, when made, shall be for the benefit of all of you collectively, which party shall be authorized by you to receipt for the same to The Mantle Lamp Company of America.

The Mantle Lamp Company of America shall have the option at any time within five years to pay to you collectively the sum of Thirty Thousand Dollars ($30,000.00) which shall be in lieu of and in full for all obligations accrued and to accrue as to compensation under this proposition. You are to designate someone to receive said Thirty Thousand Dollars ($30,000.00) in the same manner as you are to designate someone to receive the compensation of five cents (5c) per bottle.

This proposition shall inure, if you accept it, to the benefit of yourselves, your heirs, administrators, executors and assigns, under all conditions herein set forth.

If you accept this proposition, kindly sign your names hereto and return prior to January 1st, 1918.

Yours truly,

THE MANTLE LAMP COMPANY OF AMERICA,
By VICTOR S. JOHNSON,
President.

JOHN A. STEWART
AUG. HERRMANN
M. F. ROEBLING
LEE M. HIRSCHLER
BEN A. HIRSCHLER
Atty. in Fact by Lee M. Hirschler
C. E. BULTMAN
IDA MAI BULTMAN
WILLIAM W. SIMONSON
JOHN W. SULLIVAN
AUG. J. HENKEL
BEN A. HIRSCHLER

428 Cincinnati, Ohio, December 29, 1917.

The Mantle Lamp Company of America,
Chicago, Illinois.

Gentlemen:

We, the undersigned, hereby designate to you the Treasurer of The Keep-Longer Company as a proper party to whom payment shall be made under our contract with you for the payment of compensation on account of certain patents and applications for patents, inventions and improvements assigned to you by us and The Keep-Longer Company.

Yours truly,

AUG. HERRMANN
AUG. J. HENKEL
M. F. ROEBLING
JOHN W. SULLIVAN
BEN A. HIRSCHLE
C. E. BULTMAN
LEE M. HIRSCHLER
IDA MAI BULTMAN
JOHN A. STEWART

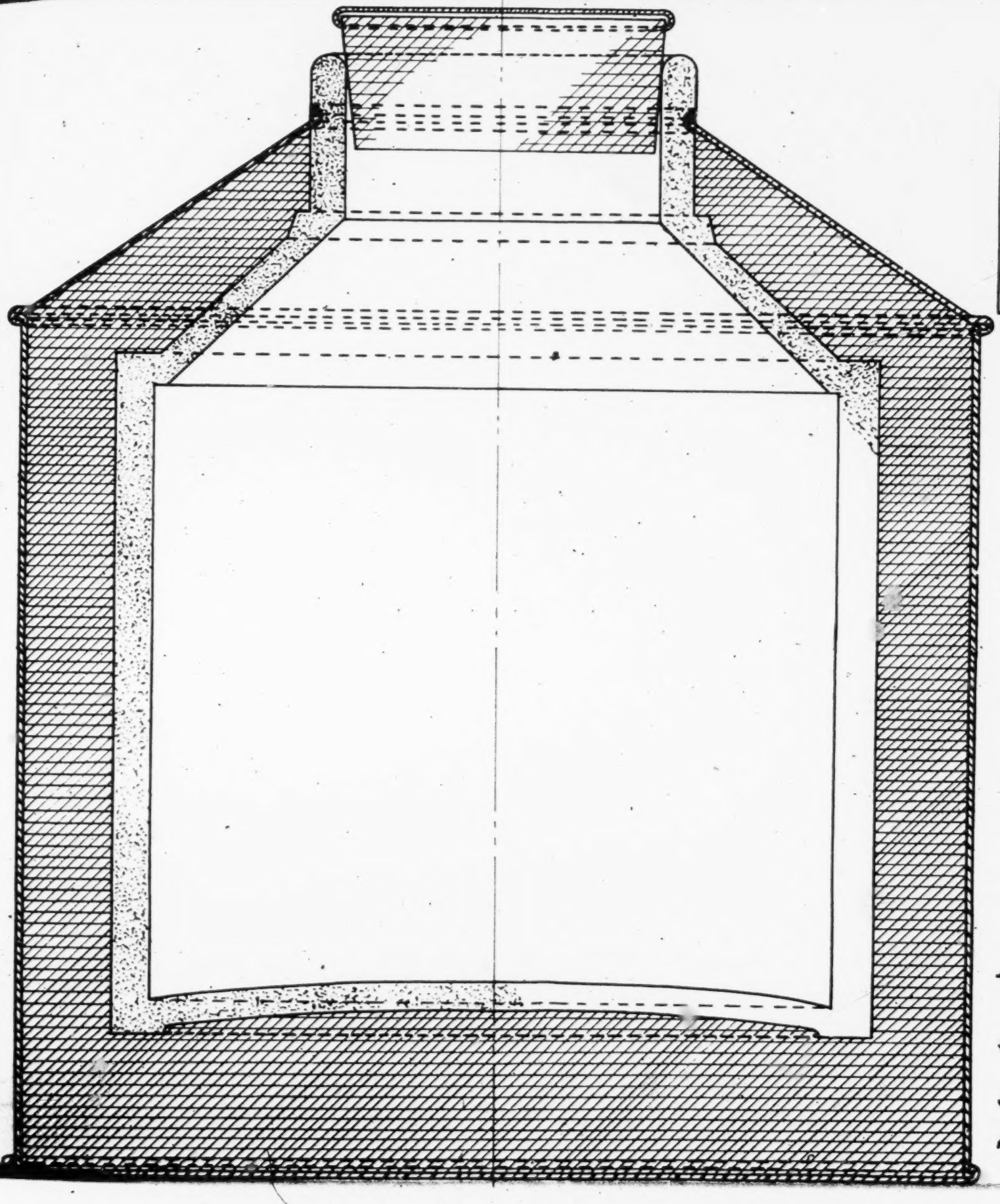


HEMP AND COMPANY
MACOMB-ILLINOIS

DRAWN	10-20-33	LANCE

DRAWING NO. 1.

Defendant's Exhibit 2



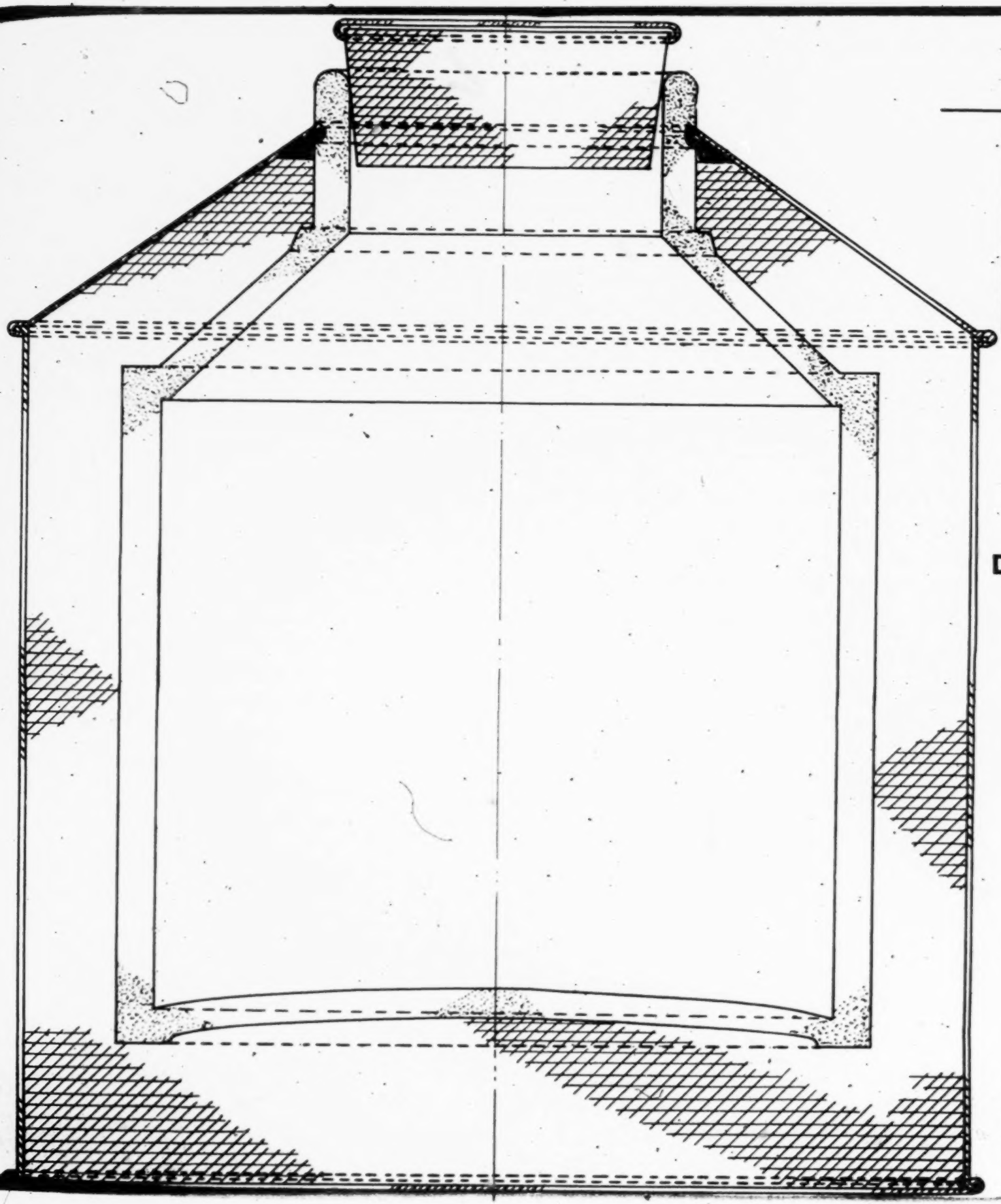
ALUMINUM

INSULATING MATERIAL-CORK

STONEWARE

STEEL

PLASTER OF PARIS AND CEMENT



HEMP AND COMPANY
MACOMB-ILLINOIS

DRAWN	10-21-33	LANCE
DRAWING NO. 2.		

Defendant's Exhibit 3

ALUMINUM

CORK

STONEWARE

STEEL

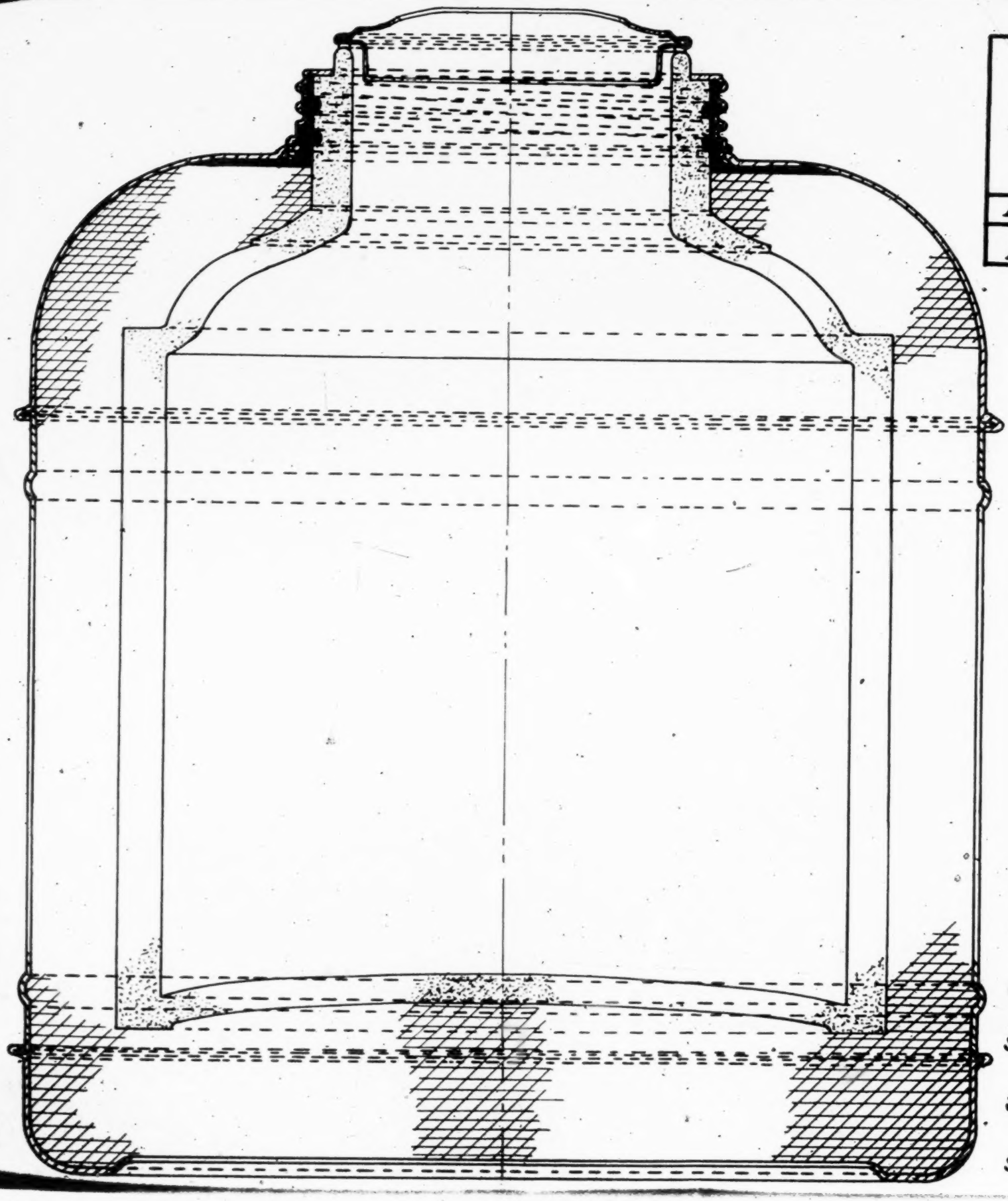
PLASTER OF PARIS AND CEMENT

HEMP AND COMPANY
MACOMB-ILLINOIS

DRAWN	10-23-33	LANCE

DRAWING NO. 6.

Defendant's Exhibit 4



ALUMINUM

CORK

STONEWARE

STEEL

SULPHUR CEMENT

496 DEFENDANT'S EXHIBIT 6.

Knight's American Mechanical Dictionary:

Being a Description of Tools, Instruments, Machines, Processes, and Engineering; History of Inventions; General Technological Vocabulary; and
Digest of Mechanical Appliances in Science and the Arts.

By Edward H. Knight,
Civil and Mechanical Engineer, Etc.

Illustrated With Upwards of Five Thousand Engravings.

"Thus Time brings all things, one by one, to sight,
And Skill evolves them into perfect light."

Lucretius, Book V.

New York: J. B. Ford and Company. 1874.

the ground ceilings are of unmanufactured materials supported on iron joists, as in Fig. 1194.

2. (Shipbuilding.) That portion of the inside skin of a vessel between the deck-beams and the [illegible] deck of the ship. Also called the *lower ceiling*. The strakes of the *ceiling* immediately below the *shelf-pieces* which support the deck-beams are called *clamps*. The outside planking is distinctively called the *skin*.

Ceiling-joist. (*Building.*) One of the *joists* spiked to a *binder*, and serving as a point of attachment for the plastering laths of the ceiling.

Cel-a-ture. The art of engraving, chasing, or embossing metals.

Cell. 1. (*Architecture.*) *n.* The space between the walls of a vault.

b. The space inclosed within the walls of an ancient temple.

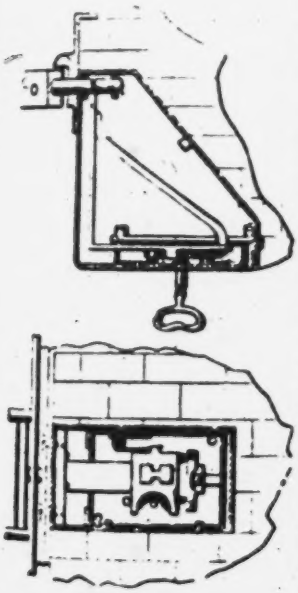
2. (*Electricity.*) A single jar, bath, or division of a compound vessel, containing a couple of plates, — as copper and zinc, — united to their opposites in each other, usually by a wire. See GALVANIC BATTERY.

3. An underground room for storage.

4. A small room for a prisoner.

5. A structure in a wrought-iron beam or girder; a tube consisting of four wrought-iron plates riveted to angle-iron at the corners. See ANGLE-IRON.

Fig. 1195.



Cell-Door Lock.

Cell-door Lock. A prison-door lock, to whose bolt no access is possible from the inside, and which may fit, as in the example, in a rabbet in the door-jamb.

The secondary bolt is supported in the inclosing shell by brackets, and is connected to the main working parts of the lock by brace-bars, so that the key gives it a movement parallel with that of the common bolt. The inclosing case has a hinged, right-angled cover, the inner fastening of which is covered by the door when closed.

Celt. The stone hammer or axe of a bygone age. Afterwards made of bronze. See HAMMER; HATCHET.

Cement. 1. A uniting composition which is plastic when applied, but hardens in place. The ingredients and character vary with the place, purpose, materials to be united, and the exposure.

ALABASTER. *a.* Plaster-of-paris, 1; yellow resin, 2; mix and apply, hot, warming the faces of the fissure or joint.

b. Sulphur or shellac, melted with plaster-of-paris. Simple plaster-of-paris.

ARCHITECTURAL. Paper pulp, sifted whiting, and size. This is a sort of papier-maché, and must be varnished or painted if exposed to the weather.

ARMENIAN. See JEWELER'S, *d.*

BOTTLE. Resin, 1; [illegible] and set in the [illegible] being heated, [illegible] a rod, or wire, or [illegible] [illegible] [illegible]

498 DEFENDANT'S EXHIBIT 8.

(Letterhead of Robert W. Hunt Company, Engineers.)

Chicago, Illinois
October 26, 1933

File No. 26334-1 Order B-79345
Report 36708

Tests of Insulated Jugs

Cromwell, Groist and Warden
38 South Dearborn Street
Chicago, Illinois

Attention: Mr. Cromwell

Gentlemen:

The following are test results, authorized by Mr. Cromwell, on six samples of insulated jugs, five of which he delivered to our laboratory on October 23, accompanied by Mr. M. D. Becker and Mr. J. L. McManus. The sixth we received from Mr. Cromwell in his office on October 24. This was of same appearance as Numbers 1, 2 and 3, and was said to have a sulphur bond. This is recorded as Laboratory Sample No. 6. These jugs were all of approximately one gallon capacity. Five bore tags. The laboratory numbers used in recording results and the tag markings follow:

Lab. Sample No...	1	2	3	4	5	6
Tag Markings....	Aluminum Products Company Litharge Bond.	Aluminum Products Company Metal to Crock Bond.	Aluminum Products Company Plaster of Paris Bond.	Aluminum Products Company Old Style Jug. Jug No. 2	Mantle Lamp Co. (Aladdin Industries Inc.) Jug No. 2.	(Not marked or tagged)

Tests were made in a room having a quite constant temperature of 73.5 to 74.5 degrees F. The jugs were kept at this temperature until all parts of jugs appeared to be at the same temperature. Then one gallon of hot water was added to each jug, thermocouple placed inside, and cover put in place. The manner and time element of starting test on each jug was the same. Temperatures of water inside, and outside temperatures at center of cap, 1/4 inch from cap, and the side 3 inches above bottom were measured at intervals by fine wire thermocouples and precision potentiometer, checked with chemical thermometers.

As readings were taken at irregular intervals, they were plotted against time, and from the charts so made the temper-

atures as shown below were recorded to the nearest 0.5 degree Fahrenheit. Results follow:

499 Lab. Sample No.	1	2	3	6*	4	5
Time	Water Temperature—deg. F.					
0 min.	150	150	150	150	150	150
5 min.	143.5	143	142.5	143	143.5	142.5
10 min.	141.5	141	141	141.5	141	140.5
20 min.	140	139	138.5	139.5	139	139.5
40 min.	137	136	135	136	137	138
60 min.	134	133.5	133		135	136.5
2 hours	127.5	128	126		129	134
3 hours	121.5	122	119		123.5	130
	Temperature at Center of Cap—deg. F.					
0 min.	74	74	74	74	74	74
5 min.	90	91	88	88	81.5	79
10 min.	97.5	98	94.5	95	87.5	81.5
20 min.	102	102	102.5	101	94	86
40 min.	102	101	105	104	99	91
60 min.	101	100	104		100	93.5
2 hours	98	99	102		97.5	92.5
3 hours	95.5	97	99		94	90
	Temperature 1/4 Inch from Cap—deg. F.					
0 min.	74	74	74	74	74	74
5 min.	88	94	87	85	81.5	78
10 min.	95	98.5	94.5	91.5	89	81.5
20 min.	99.5	101.5	101.5	98.5	96	87.5
40 min.	100	100.5	105.5	103	100	90.5
60 min.	99	99	104.5		99.5	90.5
2 hours	97	97	102		97	90
3 hours	94.5	94.5	99		94	87
	Temp. on Side 3 Inches above Bottom—deg. F.					
0 min.	74	74	74	74	74	74
5 min.	84	84	86	82	82	78
10 min.	90	90	91.5	88	88	81
20 min.	92.5	93	93	94	95	84
40 min.	89.5	90	90.5	93	93.5	86
60 min.	89.5	90	90		92.5	83.5
2 hours	90.5	91.5	89.5		91.5	81.5
3 hours	90	91	88.5		88	79.5

* Test on Sample No. 6 was run at a different time, although under the same conditions, except that test was not continued beyond 40 minutes, for the reason that the maximum outside temperatures were reached in about this period in the other tests.

500 Samples Numbers 4 and 5 were also tested without the covers furnished with the jugs, and each covered with a piece of heat insulating material. This material rested upon the top of the jug opening and was held snugly in place with a weight. Results of these tests follow:

Lab. Sample No...	4	5
Time	Water Temperature—deg. F.	
0 min.	150	150
5 min.	145	145.5
10 min.	143.5	144.5
20 min.	141.5	142
40 min.	139	140
	Temp. at Center of Threads—deg. F.	
0 min.	74	74
5 min.	85	89
10 min.	93	95
20 min.	100.5	99
40 min.	102.5	100
	Temp. 1/4 Inch from Cap—deg. F.	
0 min.	74	74
5 min.	83	81
10 min.	91	88
20 min.	99.5	94
40 min.	102	97
	Temp. on Side 3" above Bottom—deg. F.	
0 min.	74	74
5 min.	81.5	77
10 min.	86	80
20 min.	93	82.5
40 min.	91.5	83.5

Respectfully submitted,

ROBERT W. HUNT COMPANY
CROMWELL BOWEN
Cromwell Bowen

CB:GR

DEFENDANT'S EXHIBIT 10.

Filed Mar. 13, 1934. Charles M. Bates, Clerk.

501 390

DEPARTMENT OF COMMERCE

United States Patent Office

To all persons to whom these presents shall come, Greeting:

This Is To Certify that the annexed is a true copy from the records of this office of the File Wrapper and Contents, in the matter of the

Letters Patent of

Lewis Van Deventer Blair, Assignor to
The Mantle Lamp Co. of America,

Number 1,435,199, Granted November 14, 1922,

for

Improvement in Heat Insulated Receptacles.

In Testimony Whereof I have hereunto set my hand and caused the seal of the Patent Office to be affixed, at the City of Washington, this fourteenth day of October, in the year of our Lord one thousand nine hundred and thirty-three and of the Independence of the United States of America the one hundred and fifty-eighth.

CONWAY P. COE,
Commissioner of Patents.

(Seal)

Attest:

D. E. WILSON,
Chief of Division.

502 1919

~~1918~~

Number (Series of 1915), 334212 (Ex'r's Book) 45-60M
Patent No. 1435199
Div. 40 Nov 14 1922
Name Lewis Van Deventer Blair
Assor. to The Mantle Lamp Co. of America, of Chicago, Ill. (its)
of Chicago,
County of .....
State of Illinois
Invention Heat Insulated Receptacles.

Parts of Application Filed.

	Original	Renewed
Petition	Oct 29, 1919	....., 191...
Affidavit	" ", 1919	....., 191...
Specification	" ", 1919	....., 191...
Drawing	" ", 1919	....., 191...
Photo Copy	, 191	....., 191...
First Fee Cash 1 $15	Oct 29, 1919	....., 191...
" " Cert.	, 191	....., 191...
Appl. filed complete	Oct 29, 1919	....., 191...

Examined and Passed for Issue Oct 7, 1922 ....., 191...
M. K. Knotts, Acting Exr. Div. 40 Exr. Div.
Notice of Allowance Oct 7, 1922 ....., 191...
By Commissioner. By Commissioner.
Final Fee Cash $20 Oct 14, 1922 ....., 191...
" " Cert. , 191 ....., 191...
Patented Nov 14, 1922 ....., 191...
Attorney Thomas G. Steward, c/o The Mantle Lamp Co. of
2 America, 609 West Lake St. ~~348 Ashland Ave~~ Chicago, Ill.
Associate Attorney .....
3 (No. of Claims Allowed 24) Print Claims 1 in O. G. (Cl. 220-9)
Title as Allowed Heat Insulated Receptacles
In left-hand margin: Division of App., No. ....., filed ....., 191....

503 926

(2)

(From Rules of Practice, U. S. Patent Office, Page 51, Form 4.)

334212

(Stamp) $15 Rec'd Oct 29 1919 U. S. Pat. Office J

199 926

PETITION.

To the Commissioner of Patents:

The petition of [1]Lewis V. D. Blair a citizen of the United States residing at Chicago in the County of Cook, State of Illinois, and whose Post Office address is 168 North Halsted Street, Chicago, Illinois, prays that Letters Patent may be granted to him for improvements in Heat-Insulated Receptacles as set forth in the annexed specification.

And I hereby appoint [2]Thomas G. Steward, c/o The Mantle Lamp Co. of America, 348 No. Ashland Avenue, of Chicago, State of Illinois, my attorney, with full power of substitution and revocation, to prosecute this application, to make alterations and amendments therein, to receive the Patent and to transact all business in the Patent Office connected therewith.

Signed at Lancaster in the County of Fairfield and State of Ohio this 23rd day of October, 1919.

Inventor's full name.

LEWIS VAN DEVENTER BLAIR (Seal)

(Canceled U. S. Documentary 25-Cent Stamp)

334212—1

504 927

Insert A (6)

The invention relates to receptacles of the

per E heat-insulated *(NON-VACUUM) type, objects thereof being to economically

produce relatively large receptacles, to render such

[1] In case of the assignment of the whole interest in the invention, the petition and oath must be made by the actual inventor, if alive, even if the patent is to issue to an assignee. If the inventor be dead, it may be made by the executor or administrator or by the assignee of the entire interest.

[2] If the power of attorney be given to a firm, the full name of each member of the firm must be inserted, or it will be ignored.

*Matter in parentheses inserted.

receptacles sanitary and easy to clean, to improve the insulation, to provide means for easily and permanently assembling and uniting the component parts, and to minimize the transmission of shocks to the inner vessel or container which, being preferably composed of glass or other frangible substance, is likely to be broken if means for its protection from extraneous shocks are not utilized.

The invention will be best understood by referring to the drawing constituting a part of this specification in which Figure 1 is a view in elevation with portions broken away to show the lower parts of the outer jacket and the container with which a receptacle made in accordance with the invention is to be provided; and Figure 2 is a sectional view of a portion of such a receptacle showing the construction of the upper parts thereof on a larger scale.

The outer jacket, 1, is made of at least two parts, a lower cylindrical section, 2, having a bottom, 3, and an upper cylindrical section, 4, which terminates in a threaded neck, 5, having an inturned flange, 6. These two sections, 2 and 4, which are preferably of metal or other non-frangible substance, are united by a substantially air-tight and water-tight spun joint, 7, consisting of an outwardly-turned bead, 8, on one section and an inwardly turned lip, 9, on the other section, said lip being spun over said bead and being a continuation of a deflected portion, 10, of the upper section which constitutes a shoulder against which said bead rests.

505 928

The inner container, 11, may be made of glass or some

other vitreous substance, which, despite its fragility is employed because it is a poor conductor of heat and in order that the interior of the container may be properly cleaned and insanitary conditions avoided. The container is provided with a neck, 12, the upper edge, 13, of which terminates under the inturned flange, 6, of the threaded neck, 5, to which it is bonded by a substantially infusible substance 14, of low heat conductivity. The bond may be in part disposed between the necks 5 and 12, of the jacket and the container which are separated to leave a space, 15, whereby their only physical connection is through the bond, 14, which on account of its low heat conductivity and its consequent disability as a heat conductor is incapable of transferring much heat from the container to the jacket if the contents be hot, or from the jacket to the container if the contents be cold. The container should be silvered to intercept radiant heat, and, for convenience of manufacture, is made of one piece of glass. The bottom of the container is devoid of angles and is approximately of semi-spherical form, the object being to avoid fractures which are caused by unequal expansion of parts of vessels of irregular shapes.

The bottom, 3, of the jacket is provided with a support, 16, of limited area to enable the receptacle to

rest upon irregular surfaces without tilting and for re-
ducing conduction of heat to objects on which the receptacle
may be placed.

The stopper, 17, for the container, 11, is hollow and preferably made of glass, and it is provided with a rib,
18, from which it may be sustained. The air may be exhausted
from the space within the stopper, or rarified by expansion

506 929

before the stopper is closed. A gasket, 19, which may be of
rubber, is interposed between the rib, 18, and the
per E edge, *(6) ~~13~~, of
the container to make a tight joint, to cushion the surface
thereof and to prevent any considerable heat from being conducted
to the stopper, 17. The cylindrical outer wall, 20, of the
stopper and the inner cylindrical wall, 21, of the neck, 12,
are separated by an annular space, 22, to limit heat conduction
" " and are ground to remove any *(PROTUBER-
ANCES) ~~protuberances~~ or irregularities which
might, if present, interrupt the continuity of said annular
space, 22, and establish undesirable and excessive paths of
heat conductivity. The stopper, 17, is normally out of con-
tact with the contents of the container, 11, and hence all of
the heat which is conducted to the stopper must be transmitted
through the glass neck, 12, of the container which is of re-

* Matter in parentheses inserted.

latively small cross-section and a poor conductor of heat. If
the stopper were not spaced from said neck, the insulation
would be appreciably impaired and the period of heat retention
would be somewhat shortened.

The stopper has a relatively small mouth, 23, which
is provided with an external bead, 24, and this mouth is closed
by a convex cap, 25, that is secured in position by a hermetical
adherent seal, 26, extending over the edge of said mouth, and,
if desired, over said external bead.

A cover, 27, having a threaded lower edge, 28,
which engages the threads of the neck, 5, of the jacket, 1,
is provided with a centrally disposed cavity, 29, in its top
wall which cavity coincides with the convex cap, 25, of the
stopper, 17, to thereby center said stopper and compel a con-
centric disposition of said stopper and the neck, 12, of the
container, as well as to maintain the separation of their
adjacent surfaces.

" " The receptacle is provided with a *(BALE) ~~bail~~, 30, to
facilitate its handling.

The space between the jacket, and the container, 11,
is filled with a comminuted substance, 31,

507 930

of poor heat conducting properties, such as cork, and this substance is packed with sufficient density to pre-

*Matter in parentheses inserted.

vent violent pendulous movements of the container occasioned by shocks administered from without the receptacle, while permitting the expansion and contraction and the slight bodily movements of the container which are produced by changes of temperature. The walls of the jacket, 1, and the container, 11, are spaced apart a sufficient distance to prevent indented portions of the jacket from exerting pressure upon or transmitting shocks to the frangible wall of the container, and to admit of the dispersion of the force of external blows into the relatively thick protective packing, 31, in order that said frangible wall may not be broken. The distance between the walls of a vessel having substantially a capacity of one gallon should be one inch or more, and the packing should be such as to readily disperse shocks.

By employing a two-part jacket the manufacture of the receptacle is greatly facilitated. The various parts are separately produced ready for assembling, whereupon the container is inserted into the top portion of the jacket from below and bonded thereto. The container is then silvered by a well-known process and the coating of silver covered by a film of protective paint. The packing is next introduced, and this part of the assembling operation is accomplished by telescoping a cylinder, 32, of paper, or other poor conductor of heat into the section, 4, of the jacket, 1, said cylinder being substantially coextensive with said jacket.

The non-conducting filling, 31, is then placed within said cylinder and packed in the desired degree, whereupon the section, 2, of the jacket is slid over said cylinder and secured in position by spinning the lip, 9, over the bead, 8.

The substance of which the bond is composed

508

931

is, preferably, a prepared shellac which is fully described in United States Letters Patent #1,309,967, granted to Simonson and Blair on July 15, 1919. This substance is of especial utility as a bond inasmuch as it may be fused in situ at a temperature which is lower than the temperature at which glass fuses and, by sufficient heat treatment at normal pressures, becomes exceedingly tenacious and permanently adherent to the neck of the jacket and the container. The substance is ground before it is applied, and when heated it fuses and becomes sticky and immediately attaches itself to the adjacent parts. Prolonged heating hardens it, renders it substantially insoluble in alcohol, and materially raises or eliminates its melting point, so that its durability as a bond is ensured.

The tenacity of this bond is such that it is capable of supporting the container in its pendent position within the jacket without the aid of adjunctive supporting devices.

The filling between the jacket and the container is primarily employed as a shock-absorber and an insulator, and

for the purpose of preventing the container from responding
to external shocks which, if of sufficient intensity, would
cause the container to oscillate to such extent, relatively to the jacket, as to fracture its neck. Experiments have shown that the bond will remain intact and adherent
to the parts even when contiguous portions of the glass
of the container are broken by a shock.

It is important that the inner container be composed of a substance which is a poor conductor of heat,
so that heat will not be readily transmitted upward through
the body of the container to the outer jacket from which it
is suspended. Although the bonding material constituting
the seal is itself a poor conductor of heat, it is desirable
to supplement its non-heat transmitting properties as much
as possible.

509 932

Having thus described my invention, what I claim is:

per E 1. A heat-insulated vessel *(OF THE NON-VACUUM TYPE) having an outer
jacket of non-frangible material, an inner container of
frangible material, said inner container being bonded to
and pendently supported from said jacket, and heat-insulating and shock-absorbing means surrounding said container
for limiting oscillations of said container while permitting expansion thereof by changes of temperature.

* Matter in parentheses inserted.

2. A heat-insulated vessel having a transversely divided outer jacket of non-frangible material,
an inner container of frangible material bonded to the
upper portion of said jacket and pendently supported
thereby, a lining disposed within and substantially coextensive with said jacket, and a comminuted body of heat
insulating and shock-absorbing material disposed between
said container and said lining for limiting oscillations
of said container while permitting expansion thereof by changes of temperature.

~~3. A heat-insulated vessel having an outer non-frangible jacket provided with a neck and consisting of a plurality of parts united by a circumferential seam, an inner *(SINGLE-WALL) frangible container, having a neck which~~ per C Lab D'
~~is sealed to the neck of said jacket and a packing of shock-dispersing and heat-insulating material enveloping said container and of sufficient thickness to prevent indentations or distortions of said jacket from exerting a breaking pressure on said container.~~

---

per E 4. A heat-insulated vessel *(OF THE NON-VACUUM TYPE) having a non-
frangible outer jacket, an inner frangible container, and
a bond uniting said jacket and said container at their upper ends and sustaining said container in a pendent
position within said jacket, said jacket and said container

* Matter in parentheses inserted.

510 933

being sufficiently spaced to prevent indented or distorted portions of said jacket from touching said container.

per E 5. A heat-insulated vessel *(OF THE NON-VACUUM TYPE) having a two-part outer jacket, an inner container of non-corrosive material bonded directly to and pendently sustained by said outer jacket, and a comminuted packing, disposed around said container to limit pendulous movements of said container while permitting expansion and contraction thereof by changes of temperature.

6. A heat-insulated vessel having a non-frangible outer jacket provided with a top portion and a bottom portion each formed with a cylindrical wall and united by a circumferential joint, and an integral non-corrosive inner container united to said top portion by an adherent bond, and supported by said bond in a pendent position.

7. A heat-insulated vessel consisting
per C of a divided outer jacket, a *(SINGLE-WALL) container, a bond directly uniting the tops of said jacket and said container and sealing the space within said jacket, and cushioning
Insert C' means, (3) having low heat conductivity for insulating said container and for limiting pendulous movements thereof.

8. A heat-insulated vessel having an outer jacket and an inner container provided with a neck, a body

*Matter in parentheses inserted.

of heat-insulating material surrounding said container

per C and a closure for •(AND ENGAGING) the neck of said container •(AND SEPARATED) ~~spaced~~ from

" " the inner wall of said neck •(BY A HEAT-INSULATING AIR SPACE).

9. A heat-insulated vessel having an outer

per C jacket and an inner •(SINGLE-WALL) container provided with a neck, a body of heat-insulating material surrounding said con-

" " tainer, a closure for the neck of said container •(SEPARATED) ~~spaced~~

" " from the inner wall of said neck, •(BY A HEAT-INSULATING AIR SPACE) and a heat-insulating

334212—8

511 934

gasket disposed between said neck and said closure.

Sub D² ~~10. The combination with a heat-insulated vessel having an outer jacket and an inner container pro-~~

Sub B¹ ~~vided with a neck, of a closure for and spaced from the inner wall of said neck, and a cap for said jacket adapted to center said closure.~~

~~11. A heat-insulated vessel having a non-~~

per C ~~frangible •(MULTI-PART) outer jacket, an inner •(SINGLE-WALL) container of low heat conductivity pendently sustained in and separated at all points from said outer jacket by heat-insulating material.~~

Insert B²

In Testimony Whereof I affix my signature

L. V. D. BLAIR

512 935

In Testimony Whereof he affixes his signature in the presence of two witnesses.

LEWIS VAN DEVENTER BLAIR.

CARL J. POWERS.

B. E. FACTOR.

• Matter in parentheses inserted.

OATH

City of Lancaster,
County of Fairfield, } ss:
State of Ohio.

LEWIS V. D. BLAIR, the above-named petitioner, being duly sworn, deposes and says that he is a citizen of the United States and a resident of Chicago, Illinois, that he verily believes himself to be original, first, and sole inventor of the improvement in Heat-Insulated Vessels described and claimed in the annexed specification; that he does not know and does not believe that the same was ever known or used before his invention or discovery thereof, or patented or described in any printed publication in any country before his invention or discovery thereof, or more than two years prior to this application, or in public use or on sale in the United States for more than two years prior to this application; that said invention has not been patented in any country foreign to the United States on an application filed by him or his legal representatives or assigns more than twelve months prior to this application; and that no application for patent on said improvement has been filed by him or his representatives or as-

334212—10

513 936

signs in any country foreign to the United States.

LEWIS VAN DEVENTER BLAIR.

Sworn to and subscribed before me this 23rd day of Oct., 1919.

C. P. WESTENBARGER,
Notary Public.

My Commission Expires Dec. 3, 1920.

334212—11

514 2—260

Div. 40 Room 275 Paper No. 2

Address only "The Commissioner of Patents, Washington, D. C.," and not any official by name.

All communications respecting this application should give the serial number, date of filing, title of invention, and name of the applicant.

L/C

DEPARTMENT OF THE INTERIOR
United States Patent Office
Washington May 22, 1920.

(Stamp) U. S. Patent Office May 22 1920 Mailed.

Thomas G. Steward,
c/o The Mantle Lamp Co. of America,
348 Ashland Ave.,
Chicago,
Ill.

Please find below a communication from the Examiner in charge of the application of Lewis Van Deventer Blair, filed Oct. 29, 1919, Heat Insulated Receptacles, Serial No. 334,212.

JAMES T. NEWTON,
Commissioner of Patents.

The specification lacks a preamble. A preamble is required.

Claims 1, 4, 8, 9, 10 and 11 are rejected for lack of novelty over

Davis et al. 1,333,795, Mar. 16, 1920, 220-10.

Claims 2, 5 and 6 are rejected for lack of invention over Davis in view of

(6) Henn, 884,582, Apr. 14, 1908, 215-118.

No invention is apparent in constructing the outer shell portion of Davis' patent in two sections as shown by Henn.

Claims 3 and 7 are rejected for lack of novelty over

(10) Altenberg, 900,075, Oct. 6, 1908, 215-118.

W. J. ECCLESTON,
Actg. Exr. Div. 40.

334212—12

515 937

(Stamps) Mail Room Oct 25 1920 U. S. Patent Office. 3/A U. S. Patent Office Oct 26 1920 Div. 40 Paper No. & Afdvt.

UNITED STATES PATENT OFFICE

Application of
Lewis V. Blair,
#334,212,
October 29, 1919,
Heat Insulated Receptacle.

Division #40,
Room #275.

Hon. Commissioner of Patents;
Sir:

Responding to the official communication of May 22, 1920, the following amendments are directed:

Insert, as a preamble to the specification, the following:

A To All Whom It May Concern:

Be it known that I, Lewis Van Deventer Blair, a citizen of the United States, residing at Chicago, in the County of Cook and State of Illinois, have invented certain new and useful improvements in Heat-Insulated Receptacles, of which the following is a specification:

Remarks.

Claims 1, 4, 8, 9, 10, and 11 have been rejected on the patent to Davis and Sunderlin, #1,333,795, but this patent does not reveal an inner container bonded to and pendently supported from an outer jacket (claim 1); a bond uniting an outer jacket and a container (claim 4); a heat-insulating gasket interposed between the neck of an inner vessel and a closure for said neck (claim 9); a cap for the outer jacket of a heat-insulated vessel which cap is adapted to center a closure for said inner container (claim 10), or an inner container which is separated from an outer jacket, at all points except the point of support, by heat-insulating material (claim 11).

An affidavit, under Rule #75, filed herewith, shows completion of the invention prior to the date of the patentees' application, and hence the patent is not an anticipation for the aforesaid claims, or claim 8, assuming that claim 8 reads reads on the disclosure.

516 938

Claims 2, 5 and 6 have been rejected on the aforesaid patent, in view of the patent to Henn, #884,582.

Claim 2 includes, among other things, a lining which neither of the patents discloses. This lining is the element 32, and the purpose thereof is to facilitate the assembling of the parts of the vessel, as described on page 5 of the specification.

Claim 5 refers to an inner container which is bonded directly to and pendently supported by an outer jacket. The inner container of Davis and Sunderlin is bonded to a diaphragm 7, while the inner container of Henn is spaced from a collar *c* by plaster-of-paris, the outer jacket being screwed onto this collar.

Claim 6 is similar to claim 5, although it specifically states that the inner container is united to the top portion of the outer jacket.

Claims 3 and 7 have been rejected on Altenberg, #900,075, but the container of this patent is not sealed to the neck of a jacket (claim 3), the collar 21 being made of plaster-of-paris, which is porous and is, therefore, not a seal, and is not bonded to the jacket (claim 7), the plaster not being a bond. Were it not for the compression and restraint afforded by the inner vessel and its jacket, the collar would not be retained in place.

Applicant has made a very valuable invention, and receptacles embodying it are on sale all over the United States. The construction appears to be simple, but was not devised until after many attempts to make a satisfactory heat-insulated vessel had failed, and this notwithstanding the fact that experts of the highest order were engaged in the experimental work.

It is hoped that the case will now be passed to issue.

Very respectfully,

THOMAS G. STEWARD,
Attorney,
c/o Mantle Lamp Company,
Lake & Jefferson Streets,
Chicago, Illinois.

Chicago, Illinois,
September 17, 1920.

517 939

(Stamp) Mail Room Oct 25 1920 U. S. Patent Office.

UNITED STATES PATENT OFFICE.

AFFIDAVIT UNDER RULE 75.

County of Cook, } ss.
State of Illinois }

LEWIS VAN DEVENTER BLAIR, a resident of Chicago, County of Cook and State of Illinois, being duly sworn deposes and says:

That he is the applicant who, on the 29th day of October 1919, filed application #334,212, for an improvement in Heat Insulated Receptacles, in which the Examiner in charge of the application has cited the patent for improvements in Insulated Vitreous Receptacles, granted to Davis and Sunderlin on March 16, 1920 on an application filed November 7, 1918, and numbered 1,333,795;

That prior to the said filing date, November 7, 1918, he completed the invention disclosed and claimed in his aforesaid application, by constructing in the shop of The Mantle Lamp Company of America which is affiant's assignee and also the assignee of the patentees Davis and Sunderlin, aforesaid, a heat-insulated receptacle comprising an outer jacket of non-frangible material, an inner container of glass bonded to said outer jacket by a heat-treated mass of lac which hermetically sealed the space between the concentric necks of said outer jacket and said inner container and pendently supported said inner vessel from the neck of said outer jacket in such manner that said inner vessel could oscillate within said outer jacket, in a limited degree, without affecting the hermetical sealing of the space between the two vessels; and comprising, also, a comminuted body of shock-absorbing and heat-insulating material disposed between said container and said jacket for limiting the oscillations thereof, but of such density as to permit said container to expand without receiving undue molecular strains when highly heated by a contained liquid, said comminuted material being of a thickness

518 940

sufficient to prevent indentations or distortions of the outer jacket produced by outside shocks or pressure, from exerting a breaking pressure on the frangible container;

That the aforesaid heat-insulated receptacle was provided with a closure of slightly less diameter than the internal diameter of the neck of the container, and with a heat-insulating gasket disposed between said container and said closure, so that said gasket was the only medium of heat transmission between said two elements;

That the aforesaid bond constituted the only means for uniting the said jacket and said container, the heat-insulating material being of a loose character and affording no certain sustention of the container in proper relation to the jacket;

That affiant does not know and does not believe that the invention claimed by him has been in public use or on sale in the United States, or patented or described in a printed publication in the United States or any foreign country for more than two years prior to his aforesaid application, and that he has never abandoned said invention.

LEWIS VAN DEVENTER BLAIR.

Sworn to and subscribed before me this 18 day of September, 1920.

A. H. GLANTZ,
Notary Public.

Approved Nov. 13, 1920, Under Order 2255.

T. A. HOSTETLER,
Law Examiner.

334212—16

519 2—260

Div. 40 Room 275 Paper No. 4

Address only "The Commissioner of Patents, Washington, D. C.," and not any official by name.

All communications respecting this application should give the serial number, date of filing, title of invention, and name of the applicant.

Sh/C

DEPARTMENT OF THE INTERIOR
United States Patent Office
Washington Dec. 28, 1920.

(Stamp) U. S. Patent Office Dec 28 1920 Mailed.

Thomas G. Steward,
c/o The Mantle Lamp Co.,
348 Ashland Ave.,
Chicago,
Ill.

Please find below a communication from the Examiner in charge of the application of Lewis Van D. Blair, filed Oct. 29, 1919, Heat Insulated Receptacles, Serial No. 334,212.

R. F. WHITEHEAD,
Commissioner of Patents.

Responsive to amendment of Oct. 25, 1920.

Claim 7 is rejected as lacking invention over Altenberg of record, in view of Engel, cited below, or
Miller, 956,395, Apr. 26, 1910, 215-109.

Claims 8 and 9 are rejected as lacking invention over Altenberg of record, in view of
Engel, 1,199,772, Oct. 3, 1916, 215-109, or
Tallman, 825,012, July 3, 1906, 215-109.

Claim 10 is rejected on
Vanstrom, 1,267,292, May 21, 1918, 215-109,
Paalen, 928,002, July 13, 1909, 215-108,
or Bleton et al. 327,225, Sept. 29, 1885, 215-108.

The remaining claims as at present advised, may be allowed.

F. M. HOPKINS,
Exr. Div. 40.

334212—17

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941

UNITED STATES PATENT OFFICE

(Stamps) Mail Room U. S. Patent Office Dec 17 1921
U. S. Patent Office Dec 19 1921 Div. 40 Paper No. 5B

Application of
Lewis Van Deventer Blair,
#334,212,
October 29, 1919,
Heat Insulated Receptacle.

Division #40
Room #275

Hon. Commissioner of Patents,
Sir:

Responding to the official communication of December 28, 1920, the following amendments are directed:

Cancel claim 10 and substitute the following claim:

B¹ ~~10. A heat-insulated receptable including a multi-part outer jacket having a neck, a single-walled inner frangible container having a neck surrounded and laterally sustained by the neck~~ Sub D² ~~of said outer jacket and resilient heat insulating material disposed between said jacket and said container to prevent pendulous movements of said container.~~

Add the following new claims.

B² per C ~~12. A heat-insulated vessel having a non-frangible outer jacket, an inner *(SINGLE-WALL) frangible container of low heat conductivity pendently sustained in said jacket and separated at all points below the point of suspension from said outer jacket by heat-insulating material.~~

Sub D² ~~13. A heat-insulated receptacle including an outer jacket, a single-walled inner vitreous container supported in said outer jacket, and comminuted heat-insulating material disposed be-~~

* Matter in parentheses inserted.

~~tween said jacket and said container, said container having sufficient opacity to substantially conceal said insulating material.~~

~~14. A heat insulated receptacle including a vitreous~~

Sub C[3] ~~inner container and a multi-section outer jacket, the receptacle having a cup retaining screw threaded neck portion and an inturned annular flange protecting the top edge of the vitreous container.~~

334212—18

521 942

15. A heat-insulated receptacle including an inner vitreous container, a sectional outer jacket, heat insulating

B[2] material disposed between said container and jacket, and a retainer for holding said insulating material in place pending the placing in position of a section of the outer jacket.

D[3] follows.

~~16. A heat-insulated receptacle including a vitreous inner container pendently supported in a multi-section outer~~

Cancel ~~jacket and heat insulating material disposed between said container~~

per C ~~and jacket, the receptacle having a cup retaining screw-threaded neck portion and an inturned annular flange protecting the top edge of the vitreous container.~~

---

per C ~~*(16)~~ †[~~17.~~] ~~A *(DOUBLE-WALLED) heat insulated receptacle including an outer *(NON-FRANGIBLE) jacket, a single-walled inner vitreous container supported in said outer jacket, and comminuted heat-insulating material disposed be-~~

---

*Matter in parentheses inserted.
†Matter in brackets precanceled.

" " ~~tween said container and~~ *~~(SAID)~~ ~~jacket, said container having an outside~~

Sub D[3] ~~coating of silver to render it opaque and reflective of heat rays.~~

*~~(17)~~ †[~~18.~~] ~~A heat-insulated receptacle including a multi-~~

per C ~~section outer jacket, a vitreous~~ *~~(SINGLE WALLED)~~ ~~inner container, resilient heat-insulating material disposed between said jacket and said container, a section for holding a cover and a seal to prevent moisture from reaching said insulating material.~~

*~~(18)~~ †[~~19.~~] ~~A heat-insulated receptacle including a multi-~~

per C ~~section outer jacket, a vitreous~~ *~~(SINGLE WALLED)~~ ~~inner container, resilient heat-insulating material disposed between said jacket and said container, a screw-threaded section for holding a cover, and a seal to prevent moisture from reaching said insulating material.~~

---

*(19) ~~20.~~ A heat-insulated receptacle including a multi-
section outer metallic jacket, a vitreous inner container,

B[2] heat-insulating material disposed between said jacket and said
container, and a vitreous stopper carrying a resilient gasket,
said stopper being retained in position by a cup engaged with a
section of said outer jacket.

334212—19

522 943

*(20) ~~21.~~ A heat-insulated receptacle including a multi-
section outer metallic jacket, an opaque vitreous inner container,
heat-insulating material disposed between said jacket and said con-

---

* Matter in parentheses inserted.
† Matter in brackets precanceled.

tainer, and a vitreous stopper having a recess carrying a resilient
gasket, said stopper being retained in position by a cup engaged
with a section of said outer jacket.

D^4 follows.

~~*(31)~~ †[~~22.~~] ~~*A heat-insulated receptacle including a multi-*~~

per C ~~*section outer jacket, a vitreous open-mouthed*~~ ~~**(SINGLE-WALLED)*~~ ~~*inner container, re-*~~
~~*silient heat-insulating material disposed between said jacket and*~~

Sub D^4 ~~*said container, an insulated stopper for closing the mouth of*~~

" " ~~*said container,*~~ †[~~*and*~~] ~~*a section*~~ ~~**(OF SAID OUTER JACKET)*~~ ~~*having means for holding and vertically adjusting a cover.*~~

Insert D^5.

Remarks.

The patents cited by the Examiner have been carefully considered. These patents do not reveal the structures of rejected claims 7, 8, and 9, or of the newly presented claims.

Claim 7 requires that the tops of the jacket and the container shall be directly united by a bond. The bond is, therefore, the only element which determines the fixed relationship of these elements, and it is not merely a spacing element, but a tie which would operate to retain said elements, even though it were not an annulus lying between circumscribed and circumscribing parts of the device.

Claim 8 and 9 refer to a closure "spaced from the inner walls of said neck", the neck of the container. This is new, insofar as the citations show. Furthermore, considering the structure as a whole, the claims point out novelty as regards the paths of heat conductivity. Conducted heat traversing the stopper cannot pass directly to the jacket or the container, but must follow a long path through the point of contact between the stopper and its support, and thence to the body of the jacket. The units of heat capable of thus escaping from the heat-receiving portion of the stopper is very limited.

---

*Matter in parentheses inserted.
†Matter in brackets precanceled.

523 944

Claim 9 has been cancelled.

The new claim covers features which none of the patents reveal.

Claim 12 includes the pendent feature of allowed claim 11, and specifically refers to the location of the insulating material.

Claim 13 refers to the opacity of the container whereby the heat insulator is concealed, and claim 17 requires that the means for securing the opacity shall be silver which also reflects heat rays.

Claim 14 is specific to a sectional outer jacket, the neck of which is screw-threaded and flanged to protect the neck of the container and afford an anchorage for a drinking cup.

Claim 15 covers broadly the paper cylinder which is used to retain the heat-insulating material pending the addition of the bottom section of the outer jacket.

Claim 16 is distinguished by the inclusion of the screw-threaded neck and the inturned annular flange which protects the top of the container.

Claim 18 includes a cover-holding section and a seal which prevents access of moisture to the heat-insulating material.

Claim 19 adds to claim 18, the screw-threaded feature of the cover-holding section.

Claim 20 includes the vitreous stopper in combination with related elements of the retainer.

Claim 21 includes the recess in the stopper which holds the gasket.

Claim 22 deals with the vertical adjustability of the cover.

All of these claims cover combinations which should be considered as entities.

334212—21

524 945

Very respectfully,

THOMAS G. STEWARD,
Attorney,
c/o The Mantle Lamp Company
of America
609 West Lake Street,
Chicago, Illinois.

Chicago, Illinois,
December 14, 1921.

334212—22

525 2—260

Div. 40 Room 269 Sh/C Paper No. 6

Address only "The Commissioner of Patents, Washington, D. C.," and not any official by name.

All communications respecting this application should give the serial number, date of filing, title of invention, and name of the applicant.

DEPARTMENT OF THE INTERIOR
United States Patent Office
Washington Mar. 9, 1922.

(Stamp) Patent Office Mar 9 1922 Mailed.

Thomas G. Steward,
c/o The Mantle Lamp Co., of America,
609 West Lake St.,
Chicago, Ill.

Please find below a communication from the Examiner in charge of the application of Lewis Van Deventer Blair, filed Oct. 29, 1919, Heat Insulated Receptacle, Serial No. 334,212.

THOMAS E. ROBERTSON,
Commissioner of Patents.

Responsive to amendment of Dec. 17, 1921.

Claims 3, 7, 10-14, and 16-19, and 22 are rejected on Altenberg.

Claims 8 and 9 are again rejected on Altenberg in view of Engel.

The remaining claims as at present advised are allowable.

J. J. OBERLIN
Exr. Div. 40.

H.S.

334212—23

526 946

IN THE UNITED STATES PATENT OFFICE.

(Stamps) Mail Room May 10 1922 U. S. Patent Office U. S. Patent Office May 12 1922 Div. 40 Paper No. 7C

Application of
L. V. Blair,
Heat-Insulated Receptacle,
Oct. 29, 1919,
#334,212,

Division 40,
Room 269.

Hon. Commissioner of Patents,
Sir:

This is in response to the official communication of March 9th, 1922.

Claim 3, line 4, insert after "inner", single-wall.

Claim 7, line 2, insert before "container", single-wall; and, line 4, insert after the comma, said cushioning means substantially filling the space between said jacket and said container and.

C¹

Claim 8, line 4, insert after "for", and engaging; same line, substitute for "spaced", and separated; insert before the period, by a heat-insulating air space.

Claim 9, line 2, insert after "inner", single-wall; line 4, change "spaced" to separated; line 5, insert after "neck", by a heat-insulating air space.

Claim 10, line 5, insert after "container", and extending from the inner wall of said jacket to the outer wall of said container.

C²

per D

Claim 11, line 2, insert after "frangible", multi-part; same line, after "inner", insert single-wall.

Claim 12, line 2, insert after "inner", single-wall.

Substitute for claim 14 the following:

C¹ Sub D² ~~*14. A heat-insulated vessel having an outer jacket of non-frangible material, an inner single-walled container of frangible material, said inner container being pendently supported from said jacket, and heat-insulating and shock absorbing means surrounding said container for limiting oscillations of said container while permitting expansion thereof by changes of temperature.*~~

—1— 334212—24

527 947

Cancel claim 16.

Claim 17, line 1, insert after, "a", double-walled; same line, after "outer", insert non-frangible; line 4, before "jacket", insert said.

Claims 18 and 19, lines 2, insert after, "vitreous", single-walled.

Claim 22, line 2, insert before "inner", single-walled; line 5, cancel "and", first occurrence, and insert after "section", of said outer jacket.

Renumber the claims, sequentially.

Remarks.

In considering the application as amended, the Examiner is requested to bear in mind the fact that the applicant's vessel is not a vessel of the vacuum type, such as is disclosed by Altenberg or Engle, but, on the contrary, is a vessel having an inner vitreous container that is composed of one part, instead of being a double-walled affair like those of Altenberg and Engle.

The insulation is a comminuted substance which answers the two-fold purpose of heat insulation and shock insulation.

The inner container of applicant's construction, being a

single-walled vessel, may be made of much heavier material than can a vacuum vessel, and, consequently, is capable of being pendently supported in the outer jacket of a heat-

528 948

insulating receptacle, and without the employment of an under-lying support. This capability of sustention is exceedingly advantageous, because the heat-insulating substance which is disposed between the outer protective jacket and the inner vitreous container, may be loosely packed in the space between said casing and said container and unassociated with any sustaining element. In all previous constructions, the innermost container required an under-lying support, and, in many constructions, such a container required rigid lateral braces. In ordinary vacuum vessels, plugs are used to space the parts from each other, and these plugs have to be inserted before the silvering is done, so that said plugs are not concealed from view, but are observable from the inside of the vessels. The necks of vacuum vessels are exceedingly fragile, it being impossible to weld them together if they are made of glass which is thick enough to withstand any considerable shocks. The present invention admits of the use of a single-walled vessel of thick glass, or of tough glass, which is not liable to be broken and which is capable of sustaining itself in a pendent position and without danger of being cracked by shocks which tend to produce an oscillatory movement thereof.

The amendments herein made, will undoubtedly be understood without further explanation, the explanations already given being of such character as to show the reasons for the several amendments.

Respectfully submitted

THOMAS G. STEWARD,
Attorney
c/o The Mantle Lamp Co of Am
609 West Lake St.
Chicago, Ill.

Chicago, Illinois,
May 8th, 1922.
T.G.S./BO

529 949

IN THE UNITED STATES PATENT OFFICE

(Stamps) Application Div. Jun 1 1922 U. S. Patent Office U. S. Patent Office Jun 1 1922 Div. 40 Paper No. 8D

Application of
L. V. D. Blair,
Heat-Insulated Receptacle,
Oct. 29, 1919,
#334,212.

Division 40,
Room 269.

Hon. Commissioner of Patents,
Washington, D. C.

Sir:—

Substitute for claims 3, 10, 11, 12, 13, 14, 16, 17, 18 and 21, the following claims:

---

3. A heat-insulated vessel of the non-vacuum type,
having an outer non-frangible jacket provided with a neck
D[1] and consisting of a plurality of parts united by a circumferential
spun seam, a strong inner frangible container having a neck which
is sealed to the neck of said jacket*(,) and a packing of shock-
dispersing and heat-insulating material enveloping said container
and of sufficient thickness to prevent indentations or distortions
of said packet from exerting a breaking pressure on said container,
whereby oscillation of said container is limited and expansion
thereof by changes of temperature permitted.

Cl 4 follows.

---

10. A heat-insulated receptacle of the non-vacuum type, including a multi-part outer jacket having an inturned
D[2] portion at its upper end, a single-walled strong inner
as 3 frangible

* Matter in parentheses inserted.

container having a neck surrounded and laterally sustained by
said jacket*(,) and resilient heat-insulating material disposed
between said jacket and said container and extending from the
inner wall of said jacket to the outer wall of said container
for limiting the oscillation of said container while permitting
expansion thereof by changes of temperature. (X)

530 950

as 3 11. A heat-insulated vessel of the non-vacuum type, having a non-frangible multi-part outer jacket, an inner
strong single-walled container of low heat conductivity pendently
sustained in and separated at all points from said outer jacket
by heat-insulating material which limits oscillation of said
container while permitting expansion thereof by changes of
temperature.

12. A heat-insulated vessel of the non-vacuum type,
having a non-frangible outer jacket, a strong inner single-
walled frangible container of low heat conductivity pendently
sustained in said jacket and separated at all points below
the point of suspension in said outer jacket by heat insulating
D² material for limiting oscillation of said container while
permitting expansion thereof by changes of temperature.

13. A heat-insulated receptacle of the non-vacuum
per E type, including a* *(NON-FRANGIBLE) outer jacket, a strong inner vitreous

* Matter in parentheses inserted.

" " container supported in *(THE UPPER PORTION OF) said outer jacket, and a comminuted heat-insulating material disposed between said jacket and said container for limiting oscillation of said container while permitting expansion thereof by changes of temperature, said container having sufficient opacity to substantially conceal said insulating material.

14. A heat-insulated receptacle of the non-vacuum
per E type, having an *(NON-FRANGIBLE) outer jacket, a strong inner single-walled container of frangible material, said inner container being pendently sustained in said jacket, and heat-insulating and shock-absorbing means surrounding said container for limiting its oscillation while permitting expansion thereof by changes of temperature.

B² follows.

—2— 334212—28

531 951

16. A heat-insulated receptacle of the non-vacuum
D³ type, including an outer non-frangible jacket, a strong inner
per E vitreous container supported in *(THE UPPER PORTION OF) said jacket, and heat insulating material disposed between said container and said jacket for limiting oscillation of said container while permitting expansion thereof by changes of temperature, said container having an outside coating of silver to render it opaque and reflective of heat rays.

17. A heat-insulated receptable of the non-vacuum

---

*Matter in parentheses inserted.

type, including a multi-section outer jacket, a strong vitreous
per E single-walled inner container *(SUSTAINED IN THE UPPER PORTION OF SAID OUTER JACKET), resilient heat-insulating material disposed between said jacket and said container for limiting
oscillation of said container while permitting expansion thereof
" " by changes of temperature, ~~a~~ *(ONE) section ~~for~~ holding a cover, and a
seal to prevent moisture from reaching said insulating material.

18. A heat-insulated receptable of the non-vacuum type, including a multi-section outer jacket, a strong vitreous
per E single-walled inner container *(SUSTAINED IN THE UPPER PORTION OF SAID OUTER JACKET), resilient heat-insulating material disposed between said jacket and said container for limiting
oscillation of said container while permitting expansion thereof
by changes of temperature, a screw-threaded section for holding
a cover, and a seal for preventing moisture from reaching said
insulating material.

B^2 follows.

---

21. A heat-insulated receptacle of the non-vacuum
D^4 type, including a multi-section outer jacket, a vitreous
per E open-mouth single-walled inner container *(SUSTAINED IN THE UPPER PORTION OF SAID OUTER JACKET), resilient heat-
insulating material disposed between said jacket and said
container for limiting oscillation of said container while
permitting expansion thereof by changes of temperature, and

* See 1,286,017 Jones.

an insulated stopper for closing the mouth of said container,

—3— 334212—29

532 952

a section of said outer jacket having means for holding and
vertically adjusting a cover.

Add the following claims:

D[5] per E 22. A heat-insulated receptacle of the non-vacuum type, including *(A NON-FRANGIBLE OUTER JACKET) a strong inner frangible container having a
per E body portion and a neck, said neck being held laterally by *(AN UPPER) ~~a~~
part of said receptacle, and additional means for laterally
holding said body portion and for restricting convective air
currents around said container, said means consisting of
comminuted heat-insulating material surrounding said body portion
to thereby substantially prevent lateral movements of said body
portion.

per E 23. A heat-insulated receptacle of the non-vacuum type, including *(A NON-FRANGIBLE) ~~an~~ outer jacket, an inner frangible container
having a neck, the neck of said container being laterally
positioned by an adjacent part of said jacket, and the body of
said container being laterally sustained in the body of said
receptacle by a mass of comminuted heat-insulating material
disposed in the space between said bodies to restrict convective
currents of air therein and to limit the amplitude of pendul-
ous movement of the body of said container.

---

*Matter in parentheses inserted.

per E " "

24. A heat-insulated receptacle of the non-vacuum type, including ~~an~~ •(A NON-FRANGIBLE) outer jacket, a strong inner frangible container positioned at its upper end by •(AN ADJACENT PART OF) said jacket, and heat insulating material disposed within said jacket, filling the space between said jacket and said container and of sufficient density to substantially prevent said container from whipping vibrating or oscillating at its lower end. (Sig)

Remarks.

This application has been amended following a recent

334212—3

533

953

oral interview with the Examiner. Certain of the claims are now amended to clearly bring out the fact that the heat insulating material not only prevents transmission of heat but restricts the whipping action of the container when it is oscillated or vibrated by shocks, this whipping action being appropriately designated in said claims as an oscillation.

It is believed that the case is now in condition for allowance.

Very respectfully
THOMAS G. STEWARD,
Attorney

609 West Lake Street
Chicago, Ills.
c/o. The Mantle Lamp Company of America

May 29, 1912.
VSJ
TGS/BO

334212—3

• Matter in parentheses inserted.

534 (Stamps) Application Div. Sep 21 1922 U. S. Patent Office. U. S. Patent Office Sep 21 1922 Div. 40 Paper No. 9/E.

IN THE UNITED STATES PATENT OFFICE.

Application of
Lewis V. D. Blair,
Heat Insulated Receptacle.
Oct. 29, 1919.
No. 334,212.

Division 40.
Room 269.

Hon. Commissioner of Patents,
Washington, D. C.

Sir:

This is in response to the latest official communication and in pursuance of an oral interview with the Examiner in charge of the application.

Kindly correct the specification and claims as follows:

Page 2, line 2, insert after "heat-insulated" non-vacuum.

Page 2, line 10 from the bottom, change "neck 3" to neck 5.

Page 4, line 2, change "edge 13" to edge 6.

Page 4, line 8, correct the spelling of the word protuberances.

Page 4, line 4 from the bottom, change "bail" to bale.

Page 6, line 10 from the bottom, correct the spelling of the word contiguous.

Claims 1, 4 and 5, line 1 of each claim, insert after "vessel" of the non-vacuum type.

Claim 13, line 2, insert before "outer" non-frangible; same claim, line 3, insert before "said" the upper portion of.

Claim 14, line 2, insert before "outer" non-frangible.

—1— 334212—32

535 Claim 16, line 3, insert after "in" the upper portion of.

Claim 17, line 3, after "container" insert sustained in the upper portion of said outer jacket; same claim, line 6, substitute one for "a" before "section" and cancel "for".

Claim 18, line 3, after "container" insert sustained in the upper portion of said outer jacket.

Claim 21, line 3, insert after "container" sustained in the upper portion of said outer jacket.

Claim 22, line 2, insert after "including" a non-frangible outer jacket; same claim, line 3, substitute an upper for "a".

Claim 23, line 2, cancel "an" before "outer" and substitute therefor a non-frangible.

Claim 24, line 2, cancel "an" before "outer" and substitute therefor a non-frangible; same claim, line 3, insert after "by" an adjacent part of.

It is understood that these amendments place the application in condition for allowance.

Very respectfully,
T. G. STEWARD,
Attorney.

Chicago, Illinois,
September 19th, 1922.

334212—33

536 2—181

Div. 40. MLC
Address Only
The Commissioner of Patents, Serial No. 334,212.
Washington, D. C.

DEPARTMENT OF THE INTERIOR
United States Patent Office
Washington Oct. seventh, 1922.

Lewis Van Deventer Blair,
Assor. to The Mantle Lamp Co., of America, of Chicago, Ill. (its).

Sir:

Your Application for a patent for an Improvement in Heat Insulated Receptacle, filed Oct. 29, 1919, has been examined and Allowed. (24 claims)

The final fee, Twenty Dollars, must be paid not later than Six Months from the date of this present notice of allowance.

If the final fee be not paid within that period, the patent on this application will be withheld, unless renewed with an additional fee of $20, under the provisions of Section 4897, Revised Statutes.

The office delivers patents upon the day of their date, and on which their term begins to run. The printing, photolithographing, and engrossing of the several patent parts, preparatory to final signing and sealing, will require about four weeks, and such work will not be undertaken until after payment of the necessary fee.

When you send the final fee you will also send, Distinctly and Plainly Written, the name of the Inventor, Title of Invention, and Serial Number as Above Given, Date of Allowance (which is the date of this circular), Date of Filing, and, if assigned, the Names of the Assignees.

If you desire to have the patent issue to Assignees, an assignment containing a Request to that effect, together with the Fee for recording the same, must be filed in this office on or before the date of payment of final fee.

After issue of the patent uncertified copies of the drawings and specifications may be purchased at the price of Ten Cents Each. The money should accompany the order. Postage stamps will not be received.

Final fees will Not be received from other than the applicant, his assignee or attorney, or by a party in interest as shown by the records of the Patent Office.

Respectfully,

THOMAS E. ROBERTSON,
Commissioner of Patents.

Thomas G. Steward,
c/o The Mantle Lamp Co., of America,
609 West Lake St.,
Chicago,
Ill.

(In left-hand margin.) ☞ In Remitting the Final Fee Give the Serial Number at the Head of This Notice.

(In right-hand margin.) ☞ Uncertified Checks Will Not Be Accepted.

334212—34

537 (Stamp) $20.00 Rec'd Oct 14 1922 C. C. U. S. Pat. Office. B

(Letterhead of The Mantle Lamp Company of America.)

Chicago, October 12, 1922.

Commissioner of Patents,
Washington, D. C.
Sir:

Re: Serial No. 334,212
Lewis Van Deventer Blair,
Assor. to The Mantle Lamp Co.
of America, of Chicago, Ill.
Application for Improvement in
Heat Insulated Receptacle.
Filed Oct. 29/ 1919.

Enclosed find our check No. 5548 for $20.00 final fee in the above matter.

Respectfully,
THE MANTLE LAMP COMPANY OF AMERICA
V. S. JOHNSON,
President.

VSJ/EH
Enclosure.

"Largest Kerosene (Coal Oil) Mantle Lamp House in the World."

334212—35

538 #10

(Stamp) Mail Room Jul 11 1924 U. S. Patent Office.

UNITED STATES DISTRICT COURT

Southern District of Illinois.

Honorable Commissioner of Patents,
Washington, D. C.

Sir:

In compliance with the Act of February 18, 1922 (~~41~~ *42 Stat. L. 392), you are advised that there was filed on the 8th day of July, 1924, in this court an action, suit, or proceeding No. 279, entitled:

Name The Mantle Lamp Co. of America, Plaintiff,
Address Chicago, Illinois.

versus

Name Macomb Manufacturing Company, Defendant,
Address Macomb, Illinois.
brought upon the following patents:

	Patent No.	Date of Patent	Patentee
1	1,435,199	November 14, 1922	The Mantle Lamp Co., of America
2			
3			
4			
5			

In the above-entitled case, on the _____ day of _____, 192 ; the following patents have been included by _____ (insert amendment, answer, cross bill, or other pleading):

	Patent No.	Date of Patent	Patentee
1			
2			
3			
4			
5			

In the above-entitled case the following decision has been rendered or decree issued: _____

In witness whereof I have affixed my hand this 8th day of July, 1924, at Peoria, Illinois.

S. T. BURNETT,
Clerk of said Court.

334212—36

*Matter in parentheses inserted.

539

#11

(Stamp) Mail Room Jul 14 1924 U. S. Patent Office.

UNITED STATES DISTRICT COURT

District of Missouri (Western District).

Honorable Commissioner of Patents,
Washington, D. C.

Sir:

In compliance with the Act of February 18, 1922 (~~41~~ *42 Stat. L. 392), you are advised that there was filed on the 10th day of July, 1924, in this court an action, suit, or proceeding No. 546, entitled:

Name The Mantle Lamp Co. of America, Plaintiff,
Address Chicago, Illinois

versus

Name The Cutino Company, Defendant,
Address Kansas City, Missouri
brought upon the following patents:

	Patent No.	Date of Patent	Patentee
1	1,435,199	Nov. 14, 1922	The Mantle Lamp Co. of America
2			
3			
4			
5			

In the above-entitled case, on the ..... day of ....., 192 , the following patents have been included by ..... (insert amendment, answer, cross bill, or other pleading):

	Patent No.	Date of Patent	Patentee
1			
2			
3			
4			
5			

In the above-entitled case the following decision has been rendered or decree issued: .....

In witness whereof I have affixed my hand this 10th day of July, 1924, at Kansas City, Missouri.

EDWIN R. DURHAM,
Clerk of said Court.

334212—37

* Matter in parentheses inserted.

540 #12

(Stamp) Mail Room Sep 3 1926 U. S. Patent Office.
Notice of docketing.

UNITED STATES CIRCUIT COURT OF APPEALS
7th Circuit.

Honorable Commissioner of Patents,
Washington, D. C.

Sir:

In compliance with the Act of February 18, 1922 (~~41~~ *42 Stat. L. ....), you are advised that there was filed on the 28th day of August, 1926, in this court an action, suit, or proceeding No. 3812, entitled:

Name Macomb Manufacturing Co., Appellant,
Address Macomb, Illinois

versus

Name The Mantle Lamps Co. of America, Appellee,
Address Chicago, Ill.
brought upon the following patents:

	Patent No.	Date of Patent	Patentee
1	1,435,199	Nov. 14, 1922	L. V. Blair
2			
3			
4			
5			

In the above-entitled case, on the ..... day of ....., 192 , the following patents have been included by ..... (insert amendment, answer, cross bill, or other pleading):

	Patent No.	Date of Patent	Patentee
1			
2			
3			
4			
5			

In the above-entitled case the following decision has been rendered or decree issued: Pending case. Has not been heard.

In witness whereof I have affixed my hand this 2nd day of September, 1926, at Chicago.

EDWARD M. HOLLOWAY,
Clerk of said Court.

334212—38

* Matter in parentheses inserted.

541 #13

(Stamp) Mail Room Apr 16 1927 U. S. Patent Office.
Notice of docketing.

UNITED STATES CIRCUIT COURT OF APPEALS
7th Circuit.

Honorable Commissioner of Patents,
Washington, D. C.

Sir:

In compliance with the Act of February 18, 1922 (~~41~~ *42 Stat. L. ....), you are advised that there was filed on the 21st day of March, 1927, in this court an action, suit, or proceeding No. 3889, entitled:

Name The Monarch Co. et al., Appellants,
Address Webster City, Iowa

versus

Name The Mantle Lamp Co. of America, Defendant,
Address Chicago, Illinois
brought upon the following patents:

	Patent No.	Date of Patent	Patentee
1	1,435,199	Nov. 14, 1922	L. V. Blair
2			
3			
4			
5			

In the above-entitled case, on the ..... day of ..... 192 , the following patents have been included by ..... (insert amendment, answer, cross bill, or other pleading):

	Patent No.	Date of Patent	Patentee
1			
2			
3			
4			
5			

In the above-entitled case the following decision has been rendered or decree issued: Pending case. Has not been heard.

In witness whereof I have affixed my hand this 14th day of April, 1927, at Chicago.

EDWARD M. HOLLOWAY,
Clerk of said Court.

334212—39

* Matter in parentheses inserted.

542 #14

(Stamp) Mail Room Jun 3 1927 U. S. Patent Office.
Notice of decision.

UNITED STATES CIRCUIT COURT OF APPEALS
7th Circuit.

Honorable Commissioner of Patents,
Washington, D. C.

Sir:

In compliance with the Act of February 18, 1922 (~~41~~ *42 Stat. L. ___), you are advised that there was filed on the 28th day of August, 1926, in this court an action, suit, or proceeding No. 3812, entitled:

Name Macomb Manufacturing Co., Appellant,
Address Macomb, Illinois

versus

Name The Mantle Lamp Co. of America, Defendant,
Address Chicago, Ill.
brought upon the following patents:

	Patent No.	Date of Patent	Patentee
1	1,435,199	Nov. 14, 1922	L. V. Blair
2			
3			
4			
5			

In the above-entitled case, on the ____ day of ____, 192 , the following patents have been included by ____ (insert amendment, answer, cross bill, or other pleading):

	Patent No.	Date of Patent	Patentee
1			
2			
3			
4			
5			

In the above-entitled case the following decision has been rendered or decree issued: Reversing decree of District Court May 28, 1927.

In witness whereof I have affixed my hand this 1st day of June, 192 , at Chicago.

EDWARD M. HOLLOWAY,
Clerk of said Court.

334212—40

* Matter in parentheses inserted.

543 #15

(Stamp) Mail Room Jun 3 1927 U. S. Patent Office.
Notice of decision.

UNITED STATES CIRCUIT COURT OF APPEALS
7th Circuit.

Honorable Commissioner of Patents,
Washington, D. C.

Sir:

In compliance with the Act of February 18, 1922 (44 *42 State. L. ....), you are advised that there was filed on the 21st day of March, 1927, in this court an action, suit, or proceeding No. 3889, entitled:

Name The Monarch Company, et al., Appellants,
Address Webster City, Ia.

versus

Name The Mantle Lamp Co. of America, Defendant,
Address Chicago, Ill.
brought upon the following patents:

	Patent No.	Date of Patent	Patentee
1	1,435,199	Nov. 14, 1922	L. V. Blair
2			
3			
4			
5			

In the above-entitled case, on the ..... day of ....., 192 , the following patents have been included by ..... (insert amendment, answer, cross bill, or other pleading):

	Patent No.	Date of Patent	Patentee
1			
2			
3			
4			
5			

In the above-entitled case the following decision has been rendered or decree issued: Reversing decree of District Court which held patent valid and infringed, May 28, 1927.

In witness whereof I have affixed my hand this 1st day of June, 1927, at Chicago.

EDWARD M. HOLLOWAY,
Clerk of said Court.

334212—41

* Matter in parentheses inserted.

544 #16

(Stamp) Mail Room Jan 20 1929 U. S. Patent Office.

UNITED STATES DISTRICT COURT

Northern District of Ohio.

Honorable Commissioner of Patents,
Washington, D. C.

Sir:

In compliance with the Act of February 18, 1922 (~~41~~ *42 Stat. L. ——), you are advised that there was filed on the 18th day of January, 1928, in this court an action, suit, or proceeding No. 2506 entitled

Name The Mantle Lamp Company of America, Plaintiff,
Address Chicago, Ill.

versus

Name The Geo. N. Bowman Company, Defendant,
Address Cleveland, Ohio

brought upon the following patents:

Patent No.	Date of Patent	Patentee
1,435,199	November 14, 1922	Lewis Van Deventer Blair

In the above-entitled case, on the ..... day of ....., 192 , the following patents have been included by ..... (insert amendment, answer, cross bill, or other pleading:

Patent No.	Date of Patent	Patentee

In the above-entitled case the following decision has been rendered or decree issued:

In Witness Whereof I have affixed my hand this 19th day of January, 1928, at Cleveland, Ohio.

B. C. MILLER,
Clerk of said Court,
By G. L. PATTERSON,
Deputy Clerk.

334212—42

* Matter in parentheses inserted.

545 #17

(Stamp) Mail Room Feb 3 1928 U. S. Patent Office.

DISTRICT COURT OF THE UNITED STATES

Northern District of Illinois.

Honorable Commissioner of Patents,
Washington, D. C.

Sir:

In compliance with the Act of February 18, 1922 (42 Stat. L. 392), you are advised that there was filed on the 3rd day of January, 1928, in this court an action, suit, or proceeding No. 7730, entitled:

Name The Monarch Company, Inc. and et al., Plaintiff,
Address Webster City, Iowa.

versus

Name The Mantle Lamp Company of America, Defendant,
Address Chicago, Illinois.

brought upon the following patents:

	Patent No.	Date of Patent	Patentee
1	1,435,199	Nov. 14, 1922	Lewis Van Deventer Blair.
2			
3			
4			
5			

In the above-entitled case, on the ..... day of ....., 192 , the following patents have been included by .....
(insert amendment, answer, cross bill, or other pleading):

	Patent No.	Date of Patent	Patentee
1			
2			
3			
4			
5			

In the above-entitled case the following decision has been rendered or decree issued: .....

In Witness Whereof I have affixed my hand this 6th day of February, 1928, at Chicago, Illinois.

CHARLES M. BATES,
Clerk of said Court.

334212—43

546 #18

(Stamp) Mail Room Mar 3 1928 U. S. Patent Office.
Notice of docketing.

UNITED STATES CIRCUIT COURT OF APPEALS,
7th Circuit.

Honorable Commissioner of Patents,
Washington, D. C.

Sir:

In compliance with the Act of February 18, 1922 (~~41~~ *42 Stat. L. .....), you are advised that there was filed on the 15th day of February, 1928, in this court an action, suit, or proceeding No. 4012, entitled:

Name The Monarch Co. et al, Appellant,
Address Webster City, Iowa

versus

Name The Mantle Lamp Co. of America, Appellee,
Address Chicago, Illinois
brought upon the following patents:

	Patent No.	Date of Patent	Patentee
1	1,435,199	Nov. 14, 1922	Blair
2			
3			
4			
5			

In the above-entitled case, on the ..... day of ....., 192 , the following patents have been included by .....
(insert amendment, answer, cross bill, or other pleading):

	Patent No.	Date of Patent	Patentee
1			
2			
3			
4			
5			

In the above-entitled case the following decision has been rendered or decree issued: Pending case. Has not been heard.

In witness whereof I have affixed my hand this 1st day of March, 1928, at Chicago, Ill.

EDWARD M. HOLLOWAY,
Clerk of said Court.

334212—44

* Matter in parentheses inserted.

547 #19

(Stamp) Mail Room Oct 17 1929 U. S. Patent Office.

UNITED STATES DISTRICT COURT

Northern District of Ohio (Eastern Division).

Honorable Commissioner of Patents,
Washington, D. C.

Sir:

In compliance with the Act of February 18, 1922 (~~41~~ 42 Stat. L. .....), you are advised that there was filed on the 18 day of January, 1928, in this court an action, suit, or proceeding No. 2506 entitled

Name The Mantle Lamp Company of America, Plaintiff,
Address Chicago, Ill.

versus

Name The Geo. N. Bowman Company, Defendant,
Address Cleveland, Ohio

brought upon the following patents:

Patent No.	Date of Patent	Patentee
1,435,199	November 14, 1922	Lewis Van Deventer Blair

In the above-entitled case, on the..... day of....., 192 , the following patents have been included by..... (insert amendment, answer, cross bill, or other pleading:

Patent No.	Date of Patent	Patentee

In the above-entitled case the following decision has been rendered or decree issued: September 12, 1929 Order on opinion filed and entered. West, J. Claims 1, 3 to 7 inclusive, 9 to 14 inclusive, 17, 18 and 21 to 24 inclusive on patent No. 1,435,199 are invalid for want of invention. Bill dismissed at plaintiff's costs.

In Witness Whereof I have affixed my hand this 16 day of October, 1929, at Cleveland, Ohio.

B. C. MILLER,
Clerk of said Court,
By RUTH STRAIN,
Ruth Strain,
Deputy Clerk.
334212—45

548 Nov. 1, 1931 #20

No. 5606

UNITED STATES CIRCUIT COURT OF APPEALS

Sixth Circuit.

Mantle Lamp Company of America, *Appellant,*
vs.
Geo. H. Bowman Company, *Appellee.*

Appeal from the District Court for the Northern District of Ohio.

Decided November 3, 1931.

Before DENISON and MOORMAN, *Circuit Judges,* and SIMONS, *District Judge.*

DENISON, *Circuit Judge:* This is the usual patent infringement suit, based upon the Blair patent, No. 1,435,199, of November 14, 1922, for a "heat insulated receptacle." It discloses the type now common on the market, which comprises a large mouted receptacle, holding a gallon or more, insulated within an outer casing which is in the general form of a pail or a large bottle, and which efficiently keeps a substantial amount of food or drink hot or cold for several hours. The patent was sustained in the Monarch and the McComb cases, in the Northern District of Illinois (unreported), but these decrees were reversed by the Seventh C. C. A., (22 Fed. [2d], 93, 95), and the patent was held to be lacking in invention.

In the present case, the defendant filed an answer, relying upon the former decision and setting up a long list of earlier patents. It did not take proofs and did not appear at the final hearing in the court below. The plaintiff voluntarily put in evidence all the patents set up in the answer. The District Judge felt obliged to follow the earlier decision, and dismissed the bill. Upon this appeal the defendant did not appear; and

549 we accept the assurance of plaintiff's counsel that they know of no reason for defendant's default except lack of sufficient pecuniary interest. At our suggestion, we have been

furnished with copies of the records and of the briefs in the former cases, and have thus been quite fully informed as to the proofs and the contentions therein.

The modern art of efficient insulated receptacles for domestic use seems to have been begun about 1907, with the now very familiar thermos bottle, and with similar structures known as "icy-hot," or by other names. These comprised a double wall of glass with an intervening vacuum; from necessities of manufacture they were very delicate and fragile; and they had usually no greater capacity than one quart, though a two-quart size was made to some extent. Beginning about 1907, this vacuum type for keeping liquids hot or cold, became exceedingly popular. The invention now involved was put upon the market about 1918, under the trade name "Aladdin." It comprised a much larger receptacle, holding from one up to three or four gallons, and, by reason of its size and permissible large neck, was adapted to keep hot or cold not only liquids but solid or semi-solid food. It was well received and had large and increasing sales. Within a short time, it and similar articles made by others, and which are said to be infringements, had established their position as practically a new article of manufacture, and plaintiff was far and away the leader in the sales. Up until the proofs were taken it had sold over one million of them.

What Blair did, in substance, was to depart from the vacuum type; to rely for his heat insulation upon a relatively non-conducting packing between his outer and inner walls; to use an outer casing made of metal, which would be strong enough to receive ordinary shocks, and an inner container made of glass or some vitreous material that would allow the minimum of heat to escape therefrom; and to unite the outer and inner casings at their upper or neck ends, so that the inner would be pendently supported by the outer and so that the uniting means or bond should also serve as an insulator against heat or cold and as a seal to exclude air or moisture from the packing material. He was thereby enabled to, and was the first who did, put on the market a strong and satisfactorily efficient portable insulated jar or can, of relatively large size. There was, of course, nothing new in having merely the outer and inner vessels, with a packing between; but both the face of the patent and a review of the prior art

550 and the oral testimony, indicate that Blair's useful novelty, which is incorporated in several of the claims, and

which we take to be the dominant characteristic of his invention, consisted in hanging the inner container to the outer shell at the upper extremity of each by a bond which was sufficient for this supporting function and which also served the essential insulating and sealing purposes. He was thus enabled to avoid relying upon the packing material for supporting the inner container from below—a function which it could only imperfectly perform,—and to avoid any extensive contact between the inner receptable and the outer casing, whereby there would be any substantial channel for the escape of heat. Obviously, the use of a bonding material between the two instead of having any mechanical direct union, gave opportunity for interposing a comparatively non-conducting material. So far as the record indicates, there is no material used by the plaintiff or by infringers, which is suitable for this bond, which is not also, in considerable degree, heat insulating.

Claim 1 is given in the note,[1] and is sufficient to indicate the limits of the controversy. For the outer and inner containers, the parties have not used any materials other than metal for the outer and a vitreous or glass-like material for the inner. There is nothing to show that the more generic terms, non-frangible and frangible, have practically any wider application which might extend the field of prior use. The claim may, therefore, as well be read as if it called for containers that were respectively metallic and glassy.

The record leaves no doubt that Blair's combination was new, and its utility is demonstrated by the large sales and the adoption by infringers. The argument against validity is that all the elements were old and there was no invention in putting them together. The earlier existence of the elements must be conceded; outer metallic casings used with an inner glass receptacle and with interposed insulating packing were old; metal and glass had been bonded together for some purposes and to some extent by material which would adhere to each; and an inner receptacle of bottle shape had been hung by its neck from the indrawn neck of an outer casing through mechanical direct contact. All these con-

[1] A heat-insulated vessel of the non-vacuum type, having an outer jacket of non-frangible material, an inner container of frangible material, said inner container being bonded to and pendently supported from said jacket, and heat-insulating and shock-absorbing means surrounding said container for limiting oscillations of said container while permitting expansion thereof by changes of temperature.

551 structions had defects which apparently had prevented them,—something had,—from going into general use. The packing interposed between the outer and inner parts was certain to become, with use, somewhat denser and to leave the inner imperfectly supported and subject to jar and breakage. If the inner receptacle had its neck extended out so that it would rest upon the outer casing, and might, e. g., be soldered thereto, a path was given for the escape of heat. By adopting the plan of pendent support, Blair insured against failure of the interposed packing to support sufficiently, and by effecting this support by a bond between the two, rather than by a mechanical union, and by using for the bond this described material, or any other which has been found effective for that purpose, he at the same time gave support, prevented the escape of heat and sealed out the air and moisture from the packing. Further, this method of bond support was mechanically more efficient and satisfactory than the other methods which had been tried.

The substantial character of Blair's step and its non-obviousness, are demonstrated by the testimony. The manager of a leading manufacturer of bottles of the thermos or vacuum type, testifies that when they realized the demand for larger receptacles, they tried to enlarge their thermos bottle, the "icy-hot," using its method of manufacture, and they found it impossible. The mechanical difficulties of handling hot glass in the manufacturing process, so as to produce a large and heavy receptacle, were insuperable. Thereupon, in the endeavor to make an article to compete with the Aladdin, then on the market, without adopting the pendent-bond-support, they tried the best plan they knew. They inserted between the two bottoms supporting springs, which would hold the upper one against vibration and compensate for any settling in the packing; but when they produced this article for the market, they found the best they could do was to maintain the temperature three or four hours, as against six or eight for the Aladdin. The manager says that for his own use he discarded his own and bought an Aladdin. The attempt to market this article was abandoned.

The manager at the time, of the McComb Company, one of Blair's chief early competitors and defendant in one of the Illinois cases, testifies in this record. The McComb Company began to make the non-vacuum type in 1921 (the Blair patent application was filed in 1919) and sold about 1500 of its devices, which had an earthenware container

552 supported at the neck by the indrawn neck of the metallic casing. There was no bond or seal,—at least, not in any effective way. This form did not satisfy the market, after one season's trial it was abandoned and Blair's pendent-bond-support adopted.

The record in the Monarch case contains, in our view, most persuasive evidence that Blair's advance step was not one obvious to those skilled in this art. The Monarch Company was engaged for two or three years in the effort to make a satisfactory article to meet the need for a larger and stronger "thermos bottle." Its mechanics,—certainly skilled,—tried several different forms, marketed some, abandoned them, and eventually came to and adopted Blair's pendent-bond-support form, a year or more after the Aladdin was on the market. A summary of this evidence is in the note.[2]

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[2] In 1918 the Monarch Company began its attempt to develop the non-vacuum type so as to get a relatively large container. It was without knowledge of Blair's idea. It used an ordinary Mason jar, packed in a casing with interposed insulation and with a metal tube for filling and emptying, extended from the jar cover up through the open top of the outer container and soldered thereto. There was thus (perhaps) the pendent support, but no combination of metal and glass, by such a bond or support by that bond, as Blair provided, and there was an obvious metallic channel for heat escape. About the same time the Monarch people made a second form, using an earthenware container with a neck and a metallic outer jacket conically drawn in at its neck and closely surrounding the projecting earthenware neck, but there was no attempt at insulation at this point between the two, or support of one by the other, but for this support the interposed packing material was relied upon. As this could not maintain resilience, the structure was certain to be inefficient as well as heat conveying. They planned to manufacture this on a large scale, but very soon discarded it. About July, 1918, they tried a third form, upon which, in December, they filed an application for a patent (later abandoned). This was like the second form just described, except that spring supports were interposed between the two bottoms to hold the inner container up in position (like the trial form experimentally produced by the "icy-hot"). This could hardly be satisfactory; the springs could not hold the inner jar motionless, there was no bond or seal at the necks, moisture and air would enter the packing material and both the direct contact of the two necks and the lower springs would make troublesome heat conveyers. In March, 1919, they filed another patent application on a fourth and slightly different form. It lacked springs, but it had the other recited defects. They had not felt justified in trying to market any of these four forms. A fifth form, adopted October, 1919, was put upon the market. This was like numbers 3 and 4, except that they endeavored to avoid the heat escape at the contact point of the two necks by interposing a rubber gasket. There was no suggestion of bond or pendent support. There was a form of sealing by the gasket, but nothing to compel contact so as to make the seal effective. During 1919 and 1920, they marketed some 7000 jugs of this type, of which nearly half were returned as unsatisfactory. In the fall of 1920, they substituted for number 6, form number 7. This was an elaboration of the rubber gasket idea. In addition, the inner jar was pendently supported at the neck by a screw thread engagement with the cap which was in contact with the outer container. Here again there was a heat

553 We thus find that in accomplishing this combination of old elements to make a new market article, there had been not only the delay of thirty or more years since the old patents now said sufficiently to teach the combination, (though during most of this period there was no foreseen public demand for a thing of this kind), but there had been, after the demand was known, two or three years of effort by Blair's competitors to satisfy it by using their best skill in various combinations other than his, and we see that eventually one of them dropped out and the other two were compelled to use Blair's system of bond support for the pendent inner container. Seldom is there a record of failure by other things and success by the patented means, more helpful than this is upon the issue of invention.

We do not overlook the problem presented by the form of the claim. The functions of the bonding material, as an insulator to interrupt the flow of heat and as a seal to exclude air and moisture from the packing, are not specified in the claim, although they are of considerable importance, (we do not say vital), in distinguishing from the prior art. We think this patent is entitled to a fairly liberal construction in aid of its validity and ought not to be defeated by any unnecessary adherence to technical rules. We think also that the always implied "substantially as described" and the doctrine of interpretation by the specifications, justify regarding the "bond" of the claim as one which does effectively insulate the outer and inner members. The patent specifies, in line 61 of page 1, that the bonding substance shall be of low heat conductivity, and the succeeding lines emphasize that it is to be incapable of transferring much heat or cold from one to the other. Its "non-heat transmitting properties" are again emphasized in line 115 of page 2. To import this limitation into the claim is not to bring in an additional element. It is only to interpret with the aid of the specification one of the words of the claim, so that it may not be thought so broad as to be destructive.

losing contact between the inner and outer parts, and nothing resembling a supporting insulating bond between the two. As a sealing means, the rubber gasket was inefficient because it would be released whenever the cap was taken off. They manufactured and sold this form with some success for two years. Just at what time they had knowledge of the Blair construction does not appear, but in 1923, they abandoned number 7 and adopted the Blair idea of pendent-bond-support. They discarded their rubber gasket seal and separable two part form of the outer casing; they abandoned direct contact between the two necks, enlarged the outer one so as to get an intermediate space, and filled this in with a composition which was both bond and seal and which caused the inner to be pendently supported by and from the outer.

How far the sealing quality should also be implied in the claim in aid of its validity, it does not seem necessary to

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554 decide. Nor need we decide just what would or would not be the supporting bond contemplated by the claim. In defendant's form, the material of the bond is a sulphur composition. It is strongly adherent, both to glass and metal. It seems probable that it would, unaided, sufficiently support the pendent receptacle; but its operation is aided by providing grooves in the outer surface of the inner and the inner surface of the outer necks into which grooves the bonding composition enters, and which grooves therefore and in preventing any slippage as between the two members. This construction renders it less vital that the bonding material should adhere efficiently to smooth glass and smooth metal, as shown in the structure of the patent drawings; but the testimony of the experts that there is infringement is not disputed, we have no argument on the subject, and we think, for the purposes of this record, we should find that infringement exists.

The Seventh Circuit Court of Appeals relied upon three old patents as the most pertinent out of the many cited by defendant in that case, and expressed the view that in selecting elements from these three and combining them, as Blair did, there was no invention. Even if this were a case where the lack of invention could be spelled out in this way, the patents do not seem to us sufficient for that result. Clisbee No. 358,732, March 1, 1887, relates to a double wall metallic can for keeping coffee hot. The inner can is pendently supported by an upturned flange on its neck resting against the indrawn collar of the outer can, and the parts are screw-clamped together. There is no suggestion of bond or seal. The loss of heat from the direct contact of the two metal parts is obvious. The other two patents relied upon (Heath, No. 211,092, January 7, 1879, and Fox, No. 438,149, October 14, 1890) do not relate at all to heat insulation. They consist essentially of packing boxes to prevent the enclosed bottle from being broken in transportation. They do not have, in an effective sense, any bond or seal. Fox shows a wooden packing case, for transporting a glass carboy. He furnishes support apparently only from below by an interposed packing. It is true that between the neck of the carboy and the surrounding hole in the top of the wooden box, Fox puts in plaster of Paris and says that it is "to exclude water or mois-

ture." There was thus the thought of a seal, but the proof is that plaster of Paris alone does not effectively exclude air or moisture, and that it would not adhere to the wood and glass so as to support the heavy carboy. It never was

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555 intended to give pendent support. Heath, likewise, who has only a bottle cased for shipping, and whose entire stated object was to prevent breakage, has no pendent support and no bond or seal.

The leading decisions on the subject of invention are too familiar for citation. Their application depends on the facts of each case. We are constrained to the other conclusion from that reached by the Seventh Circuit Court of Appeals. It may well be noted that the testimony of two competitors, showing their unsuccessful efforts to get Blair's result by other means, was not in these McComb and Monarch records, and this proof is so important that it alone goes far toward justifying a different result here.

We have considered only claim 1. There are other claims which are broader in some respects and do not incorporate the supporting bond. They thus present questions of validity which we have not discussed. Some other claims are narrower and suggest questions of infringement. We see no object, upon this record, in considering any of these claims.

The decree will be reversed and the case remanded, with instructions to enter the usual decree for plaintiff on claim 1, and without prejudice to any rights of the plaintiff under any other claim.

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556 Notice on filing of Patent case #21

DISTRICT COURT OF THE UNITED STATES
Northern District of Ohio
Eastern Division

(Stamp) Mail Room May 14 1932 U. S. Patent Office

Honorable Commissioner of Patents, Washington, D. C.

Sir:

In compliance with the Act of February 18, 1922 (~~41~~ *42 Stat. L. ——), you are advised that there was filed on the 18th day of January, 1928, in this court an action, suit, or proceeding, No. 2506, entitled—

Name The Mantle Lamp Company of America, Plaintiff
Address Chicago, Ill.

versus

Name The George H. Bowman Company, Defendant
Address Cleveland, Ohio
brought upon the following patents:

Patent No.	Date of Patent	Patentee
1,435,199	November 14, 1922	The Mantle Lamp Company of America

In the above-entitled case, on the ..... day of ....., 193....., the following patents have been included by .....

(Insert amendment, answer, cross bill, or other pleading)

Patent No.	Date of Patent	Patentee

In the above-entitled case the following decision has been rendered or decree issued: 5/10/32 Decree after Mandate filed and entered. Bill of Complaint sustained; Claim #1 of Patent #1,435,199 good and valid in law without prejudice to other claims of said patent; The Mantle Lamp Company of America, owner of patent #1,435,199; Defendant has infringed claim #1 of patent; Plaintiff to recover damages; C. D. Friebolin, Esq., appointed Special Master for accounting; Injunction granted; Plaintiff to recover costs; increase of damages reserved pending Masters Report. West, J.

In Witness Whereof, I have affixed my hand this 10th day of May, 1932, at Cleveland, Ohio.

F. J. DENZLER,
Clerk.

By J. A. GREEN,
Deputy Clerk.

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*Matter in parentheses inserted.

557-561 * * (Printed copy U. S. Patent 1,435,199. See index.) * *

562

2—421

~~1919~~
~~1918~~

CONTENTS:

1. Application ..... papers.
2. Rejection. May 22, 1920.
3. Amdt A. Oct. 25, 1920.
4. Rejection. Dec. 28, 1920.
5. Amdt B. Dec. 17, 1921.
6. Rejection. Mar. 9, 1922.
7. Amdt C. May 10, 1922.
8. Amdt D. June 1, 1922.
9. Amdt E. Sep. 21, 1922.
10. Notice of Suit. July 11, 1924.
11. Notice of Suit. July 14, 1924.
12. Notice of C. C. Appeals. Sept. 3, 1926.
13. Notice of C. C. of Appeals. April 16, 1927.
14. Notice of C. C. of Appeals. June 3, 1927.
15. Notice of C. C. of Appeals. June 3, 1927.
16. Notice of Suit. Jan. 20, 1928.
17. Notice of Suit, Feb. 8, 1928.
18. Notice of Suit, Mar. 3, 1928.
19. Notice of Suit. Oct. 17, 1929.
20. Notice of C. C. Appeals. Nov. 1, 1931.
21. Notice of Suit. May 14, 1932.
Oath O. K. H. S. 10/7/22.

563 And afterwards, to wit, on the 13th day of March, 1934, being one of the days of the regular March term of said Court, in the record of proceedings thereof, in said entitled cause, before the Honorable John P. Barnes, District Judge, appears the following entry, to wit: Filed M 1934.

FINDINGS OF FACT AND CONCLUSIONS OF LAW.

564 In the District Court of the United States.
* * (Caption) * *

This cause came on to be heard in open court, and, at the conclusion of the evidence, the court took the matter under advisement, and counsel for the respective parties filed briefs and argued the case orally. After giving fully consideration to the evidence and to the arguments and briefs of counsel, the court has reached the following conclusions:

Findings of Fact.

1. The plaintiff and defendant are corporations domiciled as set forth in the pleadings.
2. The cause arises under the patent laws of the United States in a bill charging infringement of United States Letters Patent No. 1,435,199.
3. The court has jurisdiction of the parties and of the subject matter of the litigation.
4. The prior art knew of heat-insulated containers of the non-vacuum type.
5. The prior art knew of containers of this type wherein inner frangible containers were bonded to outer non-frangible jackets and pendently supported therefrom.
6. The prior art knew that cements could be used to bond glass to metal.
7. The prior art knew that glass and vitreous inner containers were sanitary and useful for holding foods.
8. It is old in the art to place heat insulating and shock absorbing material around inner containers pendently supported from outer jackets.

565 9. No new principle of heat insulating or shock absorbing methods, or new constructions for accomplishing the same, are defined by the claims of the Blair Patent.

10. No new device is described or disclosed in the Blair

patent, but only well known instrumentalities or expedients of the heat insulating and packaging art, functioning in their well-known ways.

11. The outer jacket, inner frangible container, bond, heat insulating and shock absorbing material of the Blair Patent perform their old and well-known functions independently of one another, without the addition of any new function or even change in the nature of their characteristic functions.

12. Clisbee Patent No. 358,732 discloses a heat-insulated vessel of the non-vacuum type having an outer jacket of non-frangible material, an inner container bonded to and pendently supported from said jacket, and heat insulating and shock absorbing means surrounding said container.

13. Sturges Patent No. 1,161,266 discloses a heat-insulated vessel of the non-vacuum type, having an outer jacket of non-frangible material, an inner container bonded to and pendently supported from said jacket, and heat insulating and shock absorbing means surrounding said container.

14. Steel Patent No. 1,067,072 discloses a heat-insulated vessel having an outer jacket of non-frangible material, an inner container of frangible material, said inner container being bonded to and pendently supported from said jacket, and heat insulating and shock absorbing means surrounding said container.

15. Bonding a metal to glass is shown to be old in the Steel Patent No. 1,067,072.

16. Pendently supporting a frangible inner container from a non-frangible outer jacket is also shown to be old in the Steel Patent No. 1,067,072.

566 17. There would be no invention in substituting the container and bond in the Steel Patent for the container and bond of either the Clisbee or the Sturges Patents.

18. Vacuum bottles or jugs and non-vacuum bottles or jugs are both heat insulated receptacles and belong to the same art.

19. There would be no invention in substituting a frangible inner container of a heat-insulated receptacle for a non-frangible one, both having been used in the same art.

20. There would be no invention in substituting the single walled inner container of a non-vacuum jug for the double walled inner container of a vacuum jug.

21. Defendant's jug has grooves on the outer neck portion of the inner container, which is bonded to a threaded portion of the outer jacket by a cement, forming a mechanical bond as taught by Steel.

22. The inner container of defendant's jug is suspended from the outer jacket by a mechanical bond as taught by Steel, Sturges, Clisbee, LeSieur and others of the prior art.

23. Defendant's jug has the old arrangement of an outer jacket, an inner container supported from the jacket by a mechanical bond, with an insulating medium arranged between the inner container and the outer jacket, as disclosed in Moore, Heath, Clisbee, Burger and Aschenbrenner, Altenberg, Lyman, Sturges, Davis and Sunderlin, and others of the prior art.

24. The plaintiff did not establish by clear and convincing proof that Blair made the alleked invention of the patent in suit at a date prior to the filing of the Blair application.

25. The testimony of plaintiff's witnesses as to a date of invention by Blair prior to his application was oral and wholly uncorroborated by any documentary or physical exhibits.

26. The testimony of plaintiff's witnesses as to a date of invention by Blair, prior to his application, was solely from memory as to an event alleged to have taken place more than fifteen years ago.

567 27. The contract, Plaintiff's Exhibit 18, refers only to vacuum bottles and vacuum containers, and in no way refers to a non-vacuum jug.

18. The alleged invention of the Blair Patent was known to and discovered by Davis and Sunderlein, and Simonson and Blair, as is clearly shown in their respective patents, applications for which were filed prior to the filing date of the Blair application.

29. LeSieur Patent No. 1,119,968 discloses a heat-insulated vessel having an outer jacket (1), an inner single-wall container (2), provided with a neck (6), a heat-insulating medium surrounding said container (3), a closure (11) for the neck of said container separated from the inner wall of said neck by a heat-insulating air space, and a heat-insulating gasket (8) disposed between said neck and said closure (11).

30. In its commercial jug, plaintiff has abandoned the adhesive bond shown and described in the Blair Patent, and uses instead the mechanical bond of the prior art.

31. The commercial success obtained by the commercial jug of plaintiff is attributable to judicious advertising and publicity, and not to use of the alleged Blair invention.

32. The Icy-Hot Bottle Company did not follow the teaching of the Blair Patent in producing its non-vacuum jug, but merely substituted a single walled inner container for its old double walled inner container as made from 1911 to 1924.

33. The evidence shows that the evolution of the later commercial jug of the Macomb Manufacturing Company from the original "Little Brown Jug" was the result of progressive development by Skilled mechanics and was not influenced by the teachings of the Blair Patent.

34. The alleged new evidence is not of such a character as to show clearly and satisfactorily that the decision of this court in this case should be different from that of the Circuit Court of Appeals for the Seventh Circuit in the McComb and Monarch cases.

568 35. The alleged new evidence is not of such a character as clearly to require a different decision by this court in this case than was made by the Circuit Court of Appeals for the Seventh Circuit when it found in the McComb and Monarch Cases that the structure of Blair was the product of mechanical skill in view of the disclosures in the Clisbee, Fox and Heath Patents, and not of inventive genius.

36. Claims 1, 3, 4, 5, 6, 7, 10, 11, 12, 13, 14, 17, 18, 21, 22, 23 and 24 of the Blair Patent in suit were formerly held to be invalid by the Circuit Court of Appeals for the Seventh Circuit in judgments entered May 28, 1927, in the suits of *Macomb Manufacturing Company* v. *The Mantle Lamp Company of America* and *Monarch Company, Inc. et al.* v. *The Mantle Lamp Company of America.*

37. The present suit was commenced on November 21, 1932, or over five years after the judgments rendered in the Macomb and Monarch suits.

38. No disclaimer has been filed to date, a period of over six years, by The Mantle Lamp Co. of America as to any of the claims held to be invalid in the Macomb and Monarch suits.

39. This delay of over five years in instituting this suit and six years to date in filing disclaimers to the claims held invalid in the Macomb and Monarch suits is unreasonable within the meaning of the disclaimer statutes, Sections 65 and 71 Title 35 U. S. C. A.

Conclusions of Law.

1. The claims in suit of the Blair Patent, as exemplified by Claim 1, are void as being directed to a device arising from the exercise of mechanical skill, as distinguished from invention.

2. The claims in suit of the Blair Patent, as exemplified by Claim 9, are void for anticipation.

569 3. The claims in suit of the Blair Patent, as exemplified by Claim 1, are void as defining aggregation of old and well-known elements.

4. The claims in suit of the Blair Patent, as exemplified by Claim 1, are void as lacking in invention over the prior art.

5. The claims in suit of the Blair Patent, as exemplified by Claim 1, are void because of prior invention by others than Blair.

6. Each of the claims of the Blair Patent is invalid for unreasonable delay and neglect in filing disclaimers to invalid claims.

7. The claims of the Blair Patent, as exemplified by Claim 1, if valid, must be limited to the use of a particular character of bond, and as so limited are not infringed.

8. The bill of complaint should be dismissed with costs to defendant.

Counsel for defendant may prepare and, on notice, present a decree in accordance with these findings and conclusions.

JOHN P. BARNES
United States District Judge.

570 And afterwards, to wit, on the 20th day of July, 1934, being one of the days of the regular July term of said Court, in the record of proceedings thereof, in said entitled cause, before the Honorable John P. Barnes, District Judge appears the following entry, to wit: Entered 20, 1

571 IN THE UNITED STATES DISTRICT COURT.

* * (Caption) * *

DECREE.

This cause came on to be heard on pleadings and proofs and briefs filed by the parties, the same having been argued by counsel, and the Court having considered the same, and being fully advised in the premises, it is hereby Ordered, Adjudged and Decree that the Bill of Complaint herein be, and the same hereby is, dismissed for want of equity with costs to defendant, and that defendant have execution therefor.

JOHN P. BARNES
United States District Judge.

Entered July 30, 1934.

Filed Aug. 21, 1934.

572 And on, to wit, the 21st day of August, 1934 came the Plaintiff by its attorneys and filed in the Clerk's office of said Court a certain Petition for Appeal in words and figures following, to wit:

573 IN THE DISTRICT COURT OF THE UNITED STATES,
* * (Caption) * *

PETITION.

The above named plaintiff, The Mantle Lamp Company of America, feeling itself aggrieved by the order and decree made and entered in the above entitled cause on the 30th day of July, 1934, holding the Blair patent No. 1,435,199, issued November 14, 1922, invalid for lack of invention and the claims thereof void for anticipation, void as being aggregations of old and well known elements, void for involving mechanical skill as distinguished from invention, void for lacking in invention over the prior art, void because of prior inventions, invalid for unreasonable delay and neglect in filing disclaimers, for limiting the Blair patent to a particular bond, and denying the relief prayed in plaintiff's bill, Does Hereby appeal from the said order and decree to the United States Circuit Court of Appeals for the Seventh Circuit, for the reasons specified in the assignment of errors filed herewith and prays that the said appeal may be allowed; that a citation be issued, directed to the above named defendant, Aluminum
574 Products Company, commanding it to be and appear before the United States Circuit Court of Appeals for the Seventh Circuit to do and receive what may appertain to justice to be done in the premises; that a transcript of the record, proceedings and papers in said cause upon which said order and decree was made, and all exhibits filed in said cause, all duly authenticated, may be filed with the clerk of the United States Circuit Court of Appeals for the Seventh Circuit, under the rules of such court in such case made and provided and that an order may be made fixing the amount of security which the plaintiff shall give and furnish on said appeal.

THE MANTLE LAMP COMPANY OF AMERICA,
By W. H. F. MILLAR
GEO. I. HAIGHT
Its Attorneys.

575 And on, to wit, the 21st day of August, 1934 came the plaintiff by its attorneys and filed in the Clerk's office of said Court a certain Assignment of Errors in words and figures following, to wit: Filed Aug. 21 1934.

576 IN THE DISTRICT COURT OF THE UNITED STATES.

* * (Caption) * *

ASSIGNMENT OF ERRORS.

Now comes the above named plaintiff, by its attorneys, and says that in the record and proceedings in the said court in the above entitled cause and in the decree made and entered therein on the 30th day of July, 1934, there is manifest error in that said decree is erroneous and against the just rights of the plaintiff and the plaintiff assigns therefore the following reasons:

The Court erred:

1. In failing to hold that claims 1, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 17, 18, 21, 22, 23 and 24 of the Blair patent No. 1,435,199 dated November 14, 1922, valid and infringed by defendant.

577 2. In failing to grant an injunction and accounting herein against the defendant.

3. Denying the relief prayed for in plaintiff's bill.

4. In not holding that the Blair patent No. 1,435,199 and particularly claims 1, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 17, 18, 21, 22, 23 and 24 thereof, valid.

5. In not holding that the defendant has infringed said Blair patent and the said claims thereof.

6. In failing to hold that Blair is the first, true and original inventor of the invention covered by the Blair patent in suit.

7. In dismissing and denying plaintiff's bill.

8. In finding that the claims of the Blair patent No. 1,435,199, as exemplified by Claim 1, are void as being directed to a device arising from the exercise of mechanical skill as distinguished from invention.

9. In finding that the claims of the Blair patent No. 1,435,199, as exemplified by Claim 9, are void for anticipation.

10. In finding that the claims of the Blair patent No.
578 1,435,199, as exemplified by Claim 1, are void as defining aggregation of old and well known elements.

11. In finding that the claims of the Blair patent No. 1,435,199, as exemplified by Claim 1, are void as lacking in invention over the prior art.

12. In finding that the claims of the Blair patent No. 1,435,199, as exemplified by Claim 1, are void because of prior invention by others than Blair.

13. In finding that each of the claims of the Blair patent No. 1,435,199, is invalid for unreasonable delay and neglect in filing disclaimers to invalid claims.

14. In finding that the claims of the Blair patent No. 1,435,199, as exemplified by Claim 1, if valid, must be limited to the use of a particular character of bond and as so limited, are not infringed.

15. In failing to find that the combination of elements in the Blair patent No. 1,435,199 was new and that its utility was demonstrated by the large sales and by the adoption by others.

16. In failing to hold that the proven efforts of other manufacturers and those skilled in the art, established that more than mechanical skill was involved in the Blair invention in suit.

579 17. In failing to follow the decision of the Circuit Court of Appeals for the Sixth Circuit, as reported in the case of *The Mantle Lamp Company of America* v. *Geo. H. Bowman Company*, 53 Fed. (2) 414.

18. In failing to hold that there was no duty placed upon the plaintiff to disclaim its patent or any of the claims thereof by reason of the diligence of the plaintiff in endeavoring to establish the validity of the said Blair patent.

19. In failing to hold that the record in this cause contains additional evidence which justified this court in following the decision of the Circuit Court of Appeals for the Sixth Circuit, 53 Fed. (2) 414, rather than the decisions of the Circuit Court of Appeals for the Seventh Circuit as reported in 22 Fed. (2) 93 and 95.

THE MANTLE LAMP COMPANY OF AMERICA,
By GEO. I. HAIGHT
W. H. F. MILLAR
Its Attorneys.

580 And afterwards, to wit, on the 21st day of August, 1934, being one of the days of the regular July term of said Court, in the record of proceedings thereof, in said entitled cause, before the Honorable Charles E. Woodward, District Judge appears the following entry, to wit:

581 IN THE DISTRICT COURT OF THE UNITED STATES. Entered Aug. 21, 1934.

(Caption)

ORDER.

On motion of George I. Haight and W. H. F. Millar, attorneys for plaintiff, It Is Hereby Ordered that an appeal to the United States Circuit Court of Appeals for the Seventh Circuit, from the decree heretofore filed and entered herein, be and the same is hereby allowed and that a certified transcript of the record, testimony in narrative form, exhibits, except those transmitted as physical exhibits, and all proceedings be forthwith transmitted to the said Circuit Court of Appeals for the Seventh Circuit.

It Is Further Ordered that the bond on appeal be fixed at the sum of Five Hundred Dollars.

Enter:

CHARLES E. WOODWARD
Judge.

582 And on, to wit, the 29th day of August, 1934 came the Plaintiff by its attorneys and filed in the Clerk's office of said Court a certain APPEAL BOND in words and figures following, to wit: Filed Aug. 29, 1934.

583 Know all Men by these Presents:

That we, The Mantle Lamp Company of America, Incorporated, as principal, and United States Fidelity and Guaranty Company, as sureties, are held and firmly bound unto Aluminum Products Co., a corporation, in the full and just sum of Five Hundred and No/100 Dollars to be paid to the said Aluminum Products Company, a corporation, its attorneys, executors, administrators, or assigns; to which payment, well and truly to be made, we bind ourselves, our heirs, executors, and administrators, jointly and severally, firmly by these presents. Sealed with our seals and dated this 23rd day of August in the year of our Lord one thousand nine hundred and thirty-four.

Whereas, lately at a session of the District Court of the United States for the Northern District of Illinois, Eastern

Division in a suit pending in said Court, between The Mantle Lamp Company of America, Incorporated, plaintiff, and Aluminum Products Company, a corporation, defendant a decree was rendered against the said The Mantle Lamp Company of America, Incorporated, and the said The Mantle Lamp Company of America, Incorporated, having obtained from said Court an order allowing an appeal to the United States Circuit Court of Appeals for the Seventh Circuit, and filed a copy thereof in the Clerk's Office of the said Court to reverse the decree of the aforesaid suit, and a citation directed to the said Aluminum Products Company, a corporation, citing and admonishing it to be and appear at the United States Circuit Court of Appeals for the Seventh Circuit, to be holden at Chicago within thirty days from the date hereof.

Now, the condition of the above obligation is such, that if the said The Mantle Lamp Company of America, Incorporated, shall prosecute its said appeal to effect, and shall answer all damages and costs that may be awarded against it if it fail to make its plea good, then the above obligation to be void; otherwise to remain in full force and virtue.

Sealed and delivered in the presence of:

_____

_____

_____

THE MANTLE LAMP COMPANY OF AMERICA, (Seal)

By A. H. GLANTZ (Seal)

Treasurer.

UNITED STATES FIDELITY & GUARANTY COMPANY, (Seal)

By W. S. LANE (Seal)

Attorney-in-fact.

Approved by:

CHARLES E. WOODWARD

Judge.

(Notary's Certificate not copied.)

584 And on, to wit, the 14th day of December, 1934, came the Parties by their attorneys and filed in the Clerk's office of said Court a certain Stipulation in words and figures following, to wit:

585 IN THE DISTRICT COURT OF THE UNITED STATES. Filed Dec. 14, 1934.
* * (Caption) * *

STIPULATION.

It Is Hereby Stipulated and Agreed by and between the parties to the above entitled cause, by their respective attorneys, that a condensed narrative statement of the evidence in the above cause having been prepared by the plaintiff and lodged in the office of the Clerk of the United States District Court, for the Northern District of Illinois, Eastern Division, at Chicago, Illinois, for the defendant's examination, and a praecipe indicating the portions of the record to be incorporated in the transcript of appeal having also been filed on November 27, 1934, in the said clerk's office, and counsel for the defendant having been duly notified thereof, that the attorneys for the plaintiff may present said condensed narrative statement of the evidence and the prae-
586 cipe for record, at the opening of court in the forenoon of Friday, December 14, 1934, or as soon thereafter as counsel can be heard, before the Honorable John P. Barnes, Judge of said court, in the room usually occupied by him as a court room in the City of Chicago, Illinois, and may move the court to have said condensed narrative statement of evidence and the said praecipe for record approved and made a part of the record for the purpose of appeal, subject to such objections as the defendant may present to the court at that time.

GEO. I. HAIGHT
W. H. F. MILLAR
Attorneys for Plaintiff, Appellant.
WM. NEVARRE CROMWELL
Attorney for Aluminum Products Company, Defendant, Appellee.

Dated, Chicago, Illinois, December 13th, 1934.

587 And afterwards, to wit, on the 14th day of December, 1934, being one of the days of the regular November term of said Court, in the record of proceedings thereof, in said entitled cause, before the Honorable John P. Barnes, District Judge, appears the following entry, to wit:

Entered Dec. 14, 1934.

588 IN THE DISTRICT COURT OF THE UNITED STATES.

* * (Caption) * *

ORDER.

It appearing to the court that Plaintiff's Exhibits,—

No. 6 Alleged infringing jug;
No. 9 Advertisement from Sporting Goods Dealer;
No. 10 Advertisement from Hardware Age;
No. 11 Advertising Circular (Firecrackers);
No. 12 Aluminum jacketed jar made by Plaintiff;
No. 13 Green jacketed jar made by Plaintiff;

and Defendant's Exhibits,—

No. 1 Fragment of broken jug;
No. 7 Jug manufactured by Plaintiff;
No. 8-a Defendant's jug with litharge seal;
No. 8-b Defendant's jug with no seal;
No. 8-c Defendant's jug with plaster of Paris seal;
No. 8-d Defendant's jug similar to Plaintiff's Exhibit 6;
No. 8-e Plaintiff's jar;
No. 8-f Defendant's jar with sulphur seal, and
No. 9 Defendant's Exhibit 9, bottle of Zonolite,

are inappropriate for insertion in the printed record and
589 have not been attached to Plaintiff's proposed record on appeal and that said exhibits should be inspected by the United States Circuit Court of Appeals in their original form,

It Is Hereby Ordered that said exhibits be transmitted by the clerk to the said court in their original form in connection with the statement of evidence and transcript.

Enter:

BARNES
Judge.

590 And afterwards, to wit, on the 19th day of September, 1934, being one of the days of the regular September term of said Court, in the record of proceedings thereof, in said entitled cause, before the Honorable Charles E. Woodward, District Judge, appears the following entry, to wit:

591 IN THE DISTRICT COURT OF THE UNITED STATES. Entered Sept. 19, 1934.

* * (Caption) * *

ORDER.

Upon application made and for good cause shown, It Is Ordered that the return day of the citation heretofore issued in this cause, the time for filing praecipe for record and lodging statement of evidence in narrative form, is extended to include October 19, 1934, and that the time for filing the transcript of record in the United States Circuit Court of Appeals, for the Seventh Circuit, is hereby extended to include October 19, 1934.

Enter:

CHARLES E. WOODWARD

Judge.

September 19, 1934.

592 And afterwards, to wit, on the 17th day of October, 1934, being one of the days of the regular October term of said Court, in the record of proceedings thereof, in said entitled cause, before the Honorable Charles E. Woodward, District Judge appears the following entry, to wit: Entered Oct. 17, 1934.

593 IN THE DISTRICT COURT OF THE UNITED STATES.

* * (Caption) * *

ORDER.

Upon application made and for good cause shown, It is Ordered that the return day of the citation heretofore issued in this cause, the time for filing praecipe for record and lodging statement of evidence in narrative form, is extended to include November 17, 1934, and that the time for filing the transcript of record in the United States Circuit Court of Appeals, for the Seventh Circuit, is hereby extended to include November 17, 1934.

Enter:

CHARLES E. WOODWARD

Judge.

Dated, October 17th, 1934.

Entered Nov. 16, 1934.

595 And afterwards, to wit, on the 16th day of November, 1934, being one of the days of the regular November term of said Court, in the record of proceedings thereof, in said entitled cause, before the Honorable Charles E. Woodward, District Judge appears the following entry, to wit:

595 IN THE DISTRICT COURT OF THE UNITED STATES.

* * (Caption) * *

ORDER.

Upon application made and for good cause shown, It Is Ordered that the return day of the citation heretofore issued in this cause, the time for filing praecipe for record and lodging statement of evidence in narrative form, is extended to include December 15, 1934, and that the time for filing the transcript of record in the United States Circuit Court of Appeals, for the Seventh Circuit, is hereby extended to include December 15, 1934.

Enter:

CHARLES E. WOODWARD

Judge.

Dated, November 16th, 1934.

Entered Dec. 15, 1934.

596 And afterwards, to wit, on the 15th day of December, 1934, being one of the days of the regular November term of said Court, in the record of proceedings thereof, in said entitled cause, before the Honorable Charles E. Woodward, District Judge appears the following entry, to wit:

597 IN THE DISTRICT COURT OF THE UNITED STATES.

* * (Caption) * *

ORDER.

Upon application made and for good cause shown, It Is Ordered that the time for filing transcript of record in the United States Circuit Court of Appeals for the Seventh Circuit and the return day of the citation heretofore issued in this cause, is hereby extended to include December 31, 1934.

Enter:

CHARLES E. WOODWARD

Judge.

Dated, December 15, 1934.

598 And on, to wit, the 27th day of November, 1934 came the Plaintiff-Appellant by its attorneys and filed in the Clerk's office of said Court a certain Praecipe in words and figures following, to wit: Filed Nov. 27, 1934.

599 IN THE DISTRICT COURT OF THE UNITED STATES.

* * (Caption) * *

PRAECIPE.

To the Clerk of the District Court:

You will please prepare a transcript of the record in the above entitled cause for transmission to the United States Circuit Court of Appeals for the Seventh Circuit and include therein the following:

1. Bill of Complaint.
2. Defendant's answer.
3. Notice of defendant to plaintiff of the reliance upon an additional defense, October 27, 1933.
4. Defendant's motion to dismiss, filed December 24, 1932.
5. Stipulation of the parties respecting prior litigation, January 21, 1933.
6. Stipulation for the use of uncertified printed or photostat copies.

600 7. Narrative statement of evidence, together with order approving same.

8. The following Plaintiff's Exhibits:

(a) #1 Certified copy of the Blair patent in suit.

(b) #2 Certified copy of bill of complaint in the case of The Mantle Lamp Company of America *vs.* Geo. H. Bowman Company. (Excluded by the Court.)

(c) #3 Certified copy of opinion of the Circuit Court of Appeals for the Sixth Circuit in the case of The Mantle Lamp Company of America *vs.* Geo. H. Bowman Company. (Excluded by the Court.)

(d) #4 Answer of defendant in the case of The Mantle Lamp Company of America *vs.* Geo. H. Bowman Company. (Excluded by the Court.)

(e) #5 Decree under mandate in the case of The Mantle Lamp Company of America *vs.* Geo. H. Bowman Company. (Excluded by the Court.)

(f) #7 Bill of Sale from Carson, Pirie Scott & Company.

(g) #8 Drawing made by witness Terry of first Macomb jar.

(h) #14 Brainard patent No. 1477101.

(i) #15 Brainard patent No. 1489059.

(j) #16 Drawing of vacuum gauge.

(k) #16-a Drawing of necks of Heath device.

(l) #17 Stanley patent No. 1071817.

(m) #18 Keep-Longer contract.

9. The following Defendant's exhibits:

(a) #2 Drawing of early Macomb jug.

(b) #3 Drawing of second Macomb jug.

(c) #4 Drawing of third Macomb jug.

601 (d) #5 Patent to Burger *et al.* Reissue No. 13093.

#5-a Patent to Clark, No. 46640.

#5-b Patent to Moore, No. 184256.

#5-c Patent to Heath, No. 211092.

#5-d Patent to Clisbee, No. 358732.

#5-e Patent to Fox, No. 438149.

#5-f Patent to Henn, No. 884582.

#5-g Patent to Altenberg, No. 900,075.

#5-h Patent to Lyman, No. 922,174.

#5-i Patent to Steel, No. 1,002,009.

#5-j Patent to Steel, No. 1,067,072.

#5-k Patent to St. Vrain Le Sieur, No. 1,119,968.

#5-l Patent to Sturges, No. 1,161,266.

#5-m Patent to Engel, No. 1,199,772.

#5-n Patent to Simonson & Blair, No. 1,309,967.

#5-o Patent to Davis & Sunderlin, No. 1,333,795.

#5-p Patent to Rood and Johnson, No. 1,362,740.

#5-q Patent to Smith, No. 1,431,189.

#5-r Patent to Simonson and Blair, No. 1,497,764.

#5-s French patent, No. 403,574.

#5-t French patent, No. 411,568.

(e) #6 Knights Mechanical Dictionary.

(f) #8 Memoranda of tests by Bowen.

(g) #10 File history of Blair patent.

10. Findings of fact and conclusions of law of District Court.

11. Decree of District Court.

602 12. Petition for appeal.

13. Order allowing appeal.

14. Assignment of Errors.

15. Appeal bond.
16. Notice of lodging narrative statement of evidence.
17. Order concerning exhibits.
18. Citation.
19. Order enlarging time for filing transcript of record.
20. Order enlarging time for filing transcript of record.
21. Order enlarging time for filing transcript of record.
21-a Order enlarging time to December 31, 1934.
22. This Praecipe.
22-a Objections to Praecipe.
22-b Order on Objections.

You will also certify to the United States Circuit Court of Appeals for the Seventh Circuit, the following Plaintiff's exhibits, as physical exhibits:

(a) #6 Alleged infringing jug.
(b) #9 Advertisement from Sporting Goods Dealer.
(c) #10 Advertisement from Hardware Age.
(d) #11 Advertising Circular (Firecrackers).
(e) #12 Aluminum jacketed jar made by Plaintiff.
(f) #13 Green jacketed jar made by Plaintiff.

You will also please certify to the United States Circuit Court of Appeals for the Seventh Circuit the following Defendant's exhibits, as physical exhibits:

(a) #1 Fragment of broken jug.
(b) #7 Jug manufactured by plaintiff.
603 (c) #8-a Defendant's jug with litharge seal.
(d) #8-b Defendant's jug with no seal.
(e) #8-c Defendant's jug with plaster of Paris seal.
(f) #8-d Defendant's jug similar to Plaintiff's Exhibit 6.
(g) #8-e Plaintiff's jar.
(h) #8-f Defendant's jar with sulphur seal.
(i) #9 Defendant's Exhibit 9, bottle of Zonolite,

and deliver to _____
printing company for printing.

GEO. I. HAIGHT
W. H. F. MILLAR
Attorneys for Plaintiff-Appellant.

Received copy of the foregoing Praecipe, this 27th day of November, 1934.

WM. NEVARRE CROMWELL
Attorney for Aluminum Products Company, Defendant-Appellee.

Filed Dec. 14. 1934.

604 And on, to wit, the 14th day of December, 1934 came the Defendant-Appellee by its attorneys and filed in the Clerk's office of said Court a certain objection to Praecipe and Motion to Strike in words and figures following, to wit:

605 IN THE DISTRICT COURT OF THE UNITED STATES.

* * (Caption) * *

OBJECTION TO CONTENTS OF PLAINTIFF-APPELLANT'S PRAECIPE AND MOTION TO STRIKE.

Now comes the defendant-appellee in the above entitled case, by its attorney, and objects to the contents of the record to be prepared on the appeal as set forth in the praecipe prepared and filed by plaintiff-appellant on the 27th day of November, 1934, and particularly to the inclusion in said record of items 8b, 8c, 8d and 8e of said praecipe for the reasons that the documents identified as such items were specifically excluded by this Court at the trial, as appears from the record of the trial proceedings, are not in evidence in this case, and are not material or relevant to the determination of the issues of this case.

Wherefore, defendant-appellee moves to strike from the aforesaid praecipe said items 8b, 8c, 8d and 8e, and, as so amended, that said praecipe be approved as setting forth the contents of the record to be prepared on the appeal of this case and prays for such other and further relief as may be necessary in the premises.

WM. NEVARRE CROMWELL
Attorney for Defendant-Appellee.

606 And afterwards, to wit, on the 14th day of December, 1934, being one of the days of the regular November term of said Court, in the record of proceedings thereof, in said entitled cause, before the Honorable John P. Barnes, District Judge appears the following entry, to wit:

607 IN THE DISTRICT COURT OF THE UNITED STATES. Entered Dec. 14, 1934.

* * (Caption) * *

Friday, December 14, A. D. 1934.

Present: Honorable John P. Barnes, Judge of said Court.

This cause coming on to be heard on motion of Defendant-Appellee to strike certain matter from Praecipe filed by Plaintiff-Appellant, after argument of counsel and due deliberation by the Court

It Is Ordered That said motion be and the same is hereby denied.

342

LEWIS VAN DEVENTER BLAIR.

HEAT INSULATED RECEPTACLE.

APPLICATION FILED OCT. 29, 1919.

1,435,199.

Patented Nov. 14, 1922.

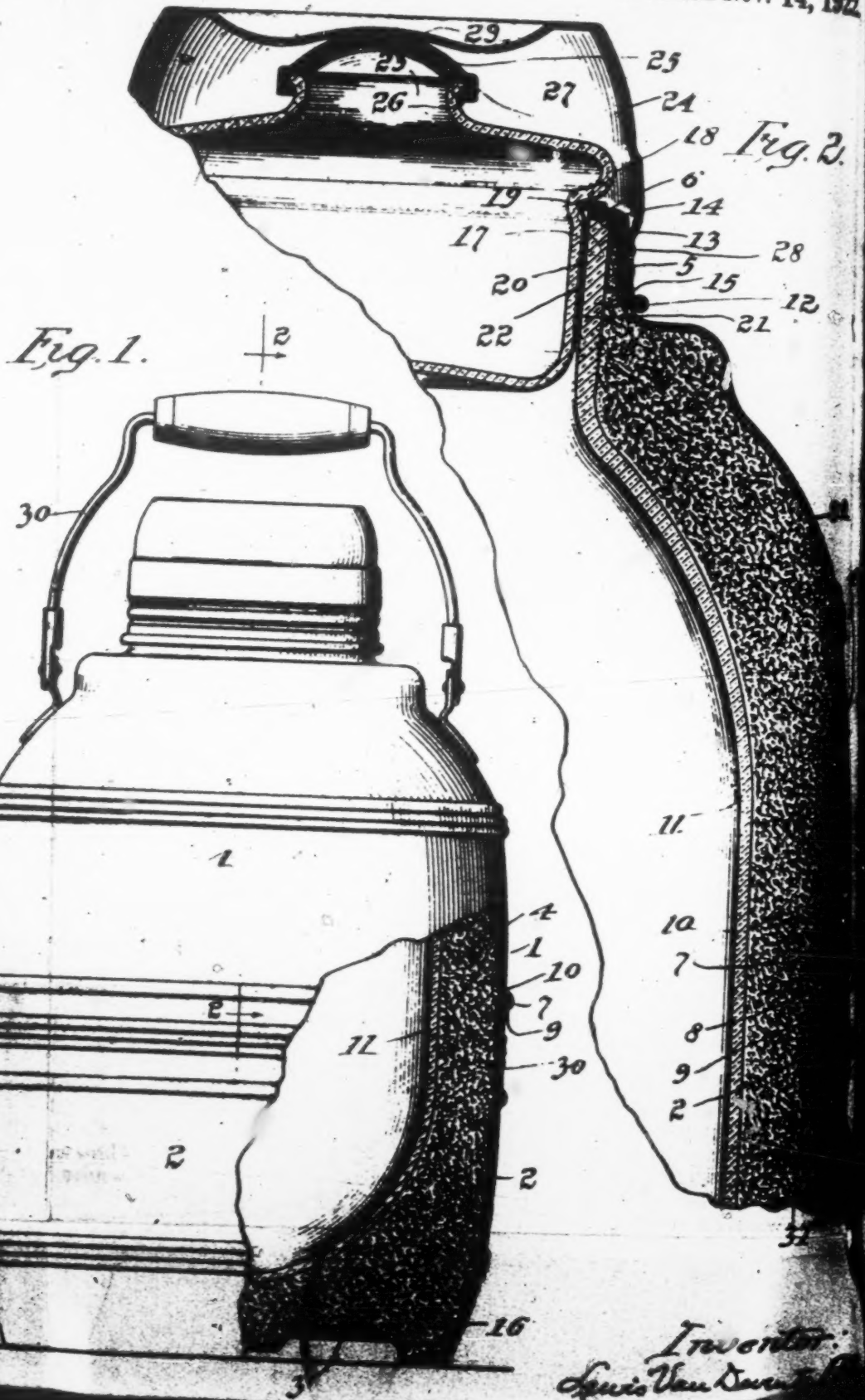


Fig. 1.

Fig. 2.

Inventor:
Lewis Van Deventer Blair

ed Nov. 14, 1922. 1,435,193

UNITED STATES PATENT OFFICE. 343

LEWIS VAN DEVENTER BLAIR, OF CHICAGO, ILLINOIS, ASSIGNOR TO THE MANTLE LAMP CO. OF AMERICA, OF CHICAGO, ILLINOIS.

HEAT-INSULATED RECEPTACLE.

Application filed October 20, 1919. Serial No. 334,212.

To all whom it may concern:

Be it known that I, LEWIS VAN DEVENTER BLAIR, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Heat-Insulated Receptacles, of which the following is a specification.

The invention relates to receptacles of the heat-insulated non-vacuum type, objects thereof being to economically produce relatively large receptacles, to render such receptacles sanitary and easy to clean, to improve the insulation, to provide means for easily and permanently assembling and uniting the component parts, and to minimize the transmission of shocks to the inner wall or container which, being preferably formed of glass or other frangible substance likely to be broken if means for protection from extraneous shocks are omitted.

The invention will be best understood by reference to the drawing constituting a part of this specification in which Figure 1 is shown in elevation with portions broken away to show the lower parts of the outer jacket and the container with which a receptacle in accordance with the invention is provided; and Figure 2 is a sectional view of a portion of such a receptacle showing the construction of the upper parts thereof on a larger scale.

The outer jacket, 1, is made of at least two parts, a lower cylindrical section, 2, having a bottom, 3, and an upper cylindrical section, 4, which terminates in a threaded neck, 5, having an inturned flange, 6. The two sections, 2 and 4, which are preferably of metal or other non-frangible substance are united by a substantially air- and water-tight spun joint, 7, consisting of an outwardly-turned bead, 8, on one section and an inwardly turned lip, 9, on the other section, said lip being spun over the bead and being a continuation of a cylindrical portion, 10, of the upper section which constitutes a shoulder against which the bead rests.

The inner container, 11, may be made of glass or some other vitreous substance, which despite its fragility is employed because it is a poor conductor of heat and in order that the interior of the container may be readily cleaned and insanitary conditions avoided. The container is provided with a neck, 12, the upper edge, 13, of which terminates under the inturned flange, 6, of the threaded neck, 5, to which it is bonded by a substantially infusible substance 14, of low heat conductivity. The bond may be in part disposed between the necks 5 and 12, of the jacket and the container which are separated to leave a space, 15, whereby their only physical connection is through the bond, 14, which on account of its low heat conductivity and its consequent disability as a heat conductor is incapable of transferring much heat from the container to the jacket if the contents be hot, or from the jacket to the container if the contents be cold. The container should be silvered to intercept radiant heat, and, for convenience of manufacture, is made of one piece of glass. The bottom of the container is devoid of angles and is approximately of semi-spherical form, the object being to avoid fractures which are caused by unequal expansion of parts of vessels of irregular shapes.

The bottom, 3, of the jacket is provided with a support, 16, of limited area to enable the receptacle to rest upon irregular surfaces without tilting and for reducing conduction of heat to objects on which the receptacle may be placed.

The stopper, 17, for the container, 11, is hollow and preferably made of glass, and it is provided with a rib, 18, from which it may be sustained. The air may be exhausted from the space within the stopper, or rarefied by expansion before the stopper is closed. A gasket, 19, which may be of rubber, is interposed between the rib, 18, and the edge, 6, of the container to make a tight joint, to cushion the surface thereof and to prevent any considerable heat from being conducted to the stopper, 17. The cylindrical outer wall, 20, of the stopper and the inner cylindrical wall, 21, of the neck, 12, are separated by an annular space, 22, to limit heat conduction and are ground to remove any protuberances or irregularities which might, if present, interrupt the continuity of said annular space, 22, and establish undesirable and excessive paths of heat conductivity. The stopper, 17, is normally out of contact with the contents of the container, 11, and hence all of the heat which is conducted to the stopper must be trans-

mitted through the glass neck, 12, of the container which is of relatively small cross-section and a poor conductor of heat. If the stopper were not spaced from said neck, the insulation would be appreciably impaired and the period of heat retention would be somewhat shortened.

The stopper has a relatively small mouth, 23, which is provided with an external bead, 24, and this mouth is closed by a convex cap, 25, that is secured in position by a hermetical adherent seal, 26, extending over the edge of said mouth, and, if desired, over said external bead.

A cover, 27, having a threaded lower edge, 28, which engages the threads of the neck, 5, of the jacket, 1, is provided with a centrally disposed cavity, 29, in its top wall which cavity coincides with the convex cap, 25, of the stopper, 17, to thereby center said stopper and compel a concentric disposition of said stopper and the neck, 12, of the container, as well as to maintain the separation of their adjacent surfaces.

The receptacle is provided with a bale, 30, to facilitate its handling.

The space between the jacket, and the container, 11, is filled with a comminuted substance 31, of poor heat conducting properties, such as cork, and this substance is packed with sufficient density to prevent violent pendulous movements of the container occasioned by shocks administered from without the receptacle, while permitting the expansion and contraction and the slight bodily movements of the container which are produced by changes of temperature. The walls of the jacket, 1, and the container, 11, are spaced apart a sufficient distance to prevent indented portions of the jacket from exerting pressure upon or transmitting shocks to the frangible wall of the container, and to admit of the dispersion of the force of external blows into the relatively thick protective packing, 31, in order that said frangible wall may not be broken. The distance between the walls of a vessel having substantially a capacity of one gallon should be one inch or more, and the packing should be such as to readily disperse shocks.

By employing a two-part jacket the manufacture of the receptacle is greatly facilitated. The [illegible] parts are separately produced [illegible], whereupon the container is [illegible] into the top portion of the [illegible] from below and bonded thereto. The container is then silvered by a well-known process and the coating of silver covered [illegible] protective paint. The [illegible] and this part of [illegible] is accomplished by [illegible] cylinder, 33, of paper, or other non-conducting filling, 31, is then placed within said cylinder and packed in the desired degree, whereupon the section, 2, of the jacket is slid over said cylinder and secured in position by spinning the lip, 9, over the bead, 8.

The substance of which the bond is composed is, preferably, a prepared shellac which is fully described in United States Letters Patent #1,309,967, granted to Simonson and Blair on July 15, 1919. This substance is of especial utility as a bond inasmuch as it may be fused in situ at a temperature which is lower than the temperature at which glass fuses and, by sufficient heat treatment at normal pressures, becomes exceedingly tenacious and permanently adherent to the neck of the jacket and the container. The substance is ground before it is applied, and when heated it fuses and becomes sticky and immediately attaches itself to the adjacent parts. Prolonged heating hardens it, renders it substantially insoluble in alcohol, and materially raises or eliminates its melting point, so that its durability as a bond is ensured. The tenacity of this bond is such that it is capable of supporting the container in a pendent position with the jacket without the aid of adjunctive supporting devices. The filling between the jacket and the container is primarily employed as a shock-absorber and an insulator, and for the purpose of preventing the container from responding to external shocks which, if of sufficient intensity, would cause the container to oscillate to such extent, relatively to the jacket, as to fracture its neck. Experiments have shown that the bond will remain intact and adherent to the parts even when contiguous portions of the glass of the container are broken by a shock.

It is important that the inner container be composed of a substance which is a poor conductor of heat, so that heat will not be readily transmitted upward through the body of the container to the outer jacket from which it is suspended. Although the bonding material constituting the seal is itself a poor conductor of heat, it is desirable to supplement its non-heat transmitting properties as much as possible.

Having thus described my invention, what I claim is:

1. A heat-insulated vessel of the non-vacuum type having an outer jacket of non-frangible material, an inner container of frangible material, said inner container being headed to and pendently supported from said jacket, and heat-insulating and shock-absorbing means surrounding said container for limiting oscillations of said container [illegible]

mitted through the glass neck, 12, of the container which is of relatively small cross-section and a poor conductor of heat. If the stopper were not spaced from said neck, the insulation would be appreciably impaired and the period of heat retention would be somewhat shortened.

The stopper has a relatively small mouth, 23, which is provided with an external bead, 24, and this mouth is closed by a convex cap, 25, that is secured in position by a hermetical adherent seal, 26, extending over the edge of said mouth, and, if desired, over said external bead.

A cover, 27, having a threaded lower edge, 28, which engages the threads of the neck, 5, of the jacket, 1, is provided with a centrally disposed cavity, 29, in its top wall which cavity coincides with the convex cap, 25, of the stopper, 17, to thereby center said stopper and compel a concentric disposition of said stopper and the neck, 12, of the container, as well as to maintain the separation of their adjacent surfaces.

The receptacle is provided with a bale, 30, to facilitate its handling.

The space between the jacket, and the container, 11, is filled with a comminuted substance 31, of poor heat conducting properties, such as cork, and this substance is packed with sufficient density to prevent violent pendulous movements of the container occasioned by shocks administered from without the receptacle, while permitting the expansion and contraction and the slight bodily movements of the container which are produced by changes of temperature. The walls of the jacket, 1, and the container, 11, are spaced apart a sufficient distance to prevent indented portions of the jacket from exerting pressure upon or transmitting shocks to the frangible wall of the container, and to admit of the dispersion of the force of external blows into the relatively thick protective packing, 31, in order that said frangible wall may not be broken. The distance between the walls of a vessel having substantially a capacity of one gallon should be one inch or more, and the packing should be such as to readily disperse shocks.

By employing a two-part jacket the manufacture of the receptacle is greatly facilitated. The [illegible] parts are separately produced [illegible] assembling, whereupon the container is inserted into the top portion of the jacket from below and bonded thereto. The container is then silvered by a well-known process and the coating of silver covered by a [illegible] protective paint. The [illegible] is introduced, and this part of the [illegible] operation is accomplished by [illegible] cylinder, 33, of paper, or other [illegible] material into the section, 4, of the jacket, 1, said cylinder being substantially coextensive with said jacket. The non-conducting filling, 31, is then [illegible] within said cylinder and packed in the [illegible] sired degree, whereupon the section, 2, of the jacket is slid over said cylinder and secured in position by spinning the lip, 9, over the bead, 8.

The substance of which the bond is composed is, preferably, a prepared shellac which is fully described in United States Letters Patent #1,309,967, granted to Simonson and Blair on July 15, 1919. This substance is of especial utility as a bond inasmuch as it may be fused in situ at a temperature which is lower than the temperature at which glass fuses and, by sufficient heat treatment at normal pressures, becomes, exceedingly tenacious and permanently adherent to the neck of the jacket and the container. The substance is ground before it is applied, and when heated it fuses and becomes sticky and immediately attaches itself to the adjacent parts. Prolonged heating hardens it, renders it substantially insoluble in alcohol, and materially raises or eliminates its melting point, so that its durability as a bond is ensured. The tenacity of this bond is such that it is capable of supporting the container in its pendent position with the jacket without the aid of adjunctive supporting devices. The filling between the jacket and the container is primarily employed as a shock-absorber and an insulator, and for the purpose of preventing the container from responding to external shocks which, if of sufficient intensity, would cause the container to oscillate to such extent, relatively to the jacket, as to fracture its neck. Experiments have shown that the bond will remain intact and adherent to the parts even when contiguous portions of the glass of the container are broken by a shock.

It is important that the inner container be composed of a substance which is a poor conductor of heat, so that heat will not be readily transmitted upward through the body of the container to the outer jacket from which it is suspended. Although the bonding material constituting the seal is itself a poor conductor of heat, it is desirable to supplement its non-heat transmitting properties as much as possible.

Having thus described my invention, what I claim is:

1. A heat-insulated vessel of the non-vacuum type having an outer jacket of non-frangible material, an inner container of frangible material, said inner container being bonded to and pendently supported from said jacket, and heat-insulating and shock-absorbing means surrounding said container for limiting oscillations of said container while permitting expansion thereof by changes of temperature.

2. A heat-insulated vessel having a tru[illegible]

...y divided outer jacket of non-fran... material, an inner container of fran... material bonded to the upper portion ... jacket and pendently supported ..., a lining disposed within and sub... ...y coextensive with said jacket, and ...inuted body of heat insulating and ...sorbing material disposed between ...tainer and said lining for limiting ...ons of said container while permit... ...ansion thereof by changes of tem...

... heat-insulated vessel of the non... type, having an outer non-frangible ... provided with a neck and consisting ...rality of parts united by a circum... ...l spun seam, a strong inner frangi... ...ainer having a neck which is sealed ... neck of said jacket, and a packing ...-dispersing and heat-insulating ma... ...veloping said container and of suf... thickness to prevent indentations or ...ons of said jacket from exerting a ... pressure on said container, where... ...lation of said container is limited ...ansion thereof by changes of tem... ... permitted.

... heat-insulated vessel of the non... type having a non-frangible outer ... an inner frangible container, and a ...iting said jacket and said container ... upper ends and sustaining said con... ...in a pendent position within said ...aid jacket and said container being ...ly spaced to prevent indented or ...l portions of said jacket from touch... ... container.

... heat-insulated vessel of the non... type having a two-part outer jacket, ...r container of non-corrosive mate... ...ded directly to and pendently sus... ...by said outer jacket, and a commi... ...cking, disposed around said con... ...o limit pendulous movements of said ...r while permitting expansion and ...ion thereof by changes of tempera...

... heat-insulated vessel having a non... ...a outer jacket provided with a top ... and a bottom portion each formed ...ylindrical wall and united by a cir... ...ential joint, and an integral non-cor... ...ner container united to said top ... by an adherent bond, and supported ...d bond in a pendent position.

... heat-insulated vessel consisting of a ...ded outer jacket, a single-wall container, ...ond directly uniting the tops of said ...et and said container and sealing the ...e within said jacket, and cushioning ...ns, said cushioning means substantially ...g the space between said jacket and ...container and having low heat conduc... ...y for insulating said container and for ...dulous movements thereof.

8. A heat-insulated vessel having an outer jacket and an inner container provided with a neck, a body of heat-insulating material surrounding said container and a closure for and engaging the neck of said container and separated from the inner wall of said neck by a heat-insulating air space.

9. A heat-insulated vessel having an outer jacket and an inner single-wall container provided with a neck, a body of heat-insulating material surrounding said container, a closure for the neck of said container separated from the inner wall of said neck, by a heat-insulating air space and a heat-insulating gasket disposed between said neck and said closure.

10. A heat-insulated receptacle of the non-vacuum type, including a multi-part outer jacket having an inturned portion at its upper end, a single-walled strong inner frangible container having a neck surrounded and laterally sustained by said jacket, and resilient heat-insulating material disposed between said jacket and said container and extending from the inner wall of said jacket to the outer wall of said container for limiting the oscillation of said container while permitting expansion thereof by changes of temperature.

11. A heat-insulated vessel of the non-vacuum type, having a non-frangible multi-part outer jacket, an inner strong single-walled container of low heat conductivity pendently sustained in and separated at all points from said outer jacket by heat-insulating material which limits oscillation of said container while permitting expansion thereof by changes of temperature.

12. A heat-insulated vessel of the non-vacuum type, having a non-frangible outer jacket, a strong inner single-walled frangible container of low heat conductivity pendently sustained in said jacket and separated at all points below the point of suspension in said outer jacket by heat insulating material for limiting oscillation of said container while permitting expansion thereof by changes of temperature.

13. A heat-insulated receptacle of the non-vacuum type, including a non-frangible outer jacket, a strong inner vitreous container supported in the upper portion of said outer jacket, and a comminuted heat-insulating material disposed between said jacket and said container for limiting oscillation of said container while permitting expansion thereof by changes of temperature, said container having sufficient opacity to substantially conceal said insulating material.

14. A heat-insulated receptacle of the non-vacuum type, having a non-frangible outer jacket, a strong inner single-walled container of frangible material, said inner container being pendently sustained in said

...y divided outer jacket of non-fran... ...material, an inner container of fran... ...material bonded to the upper portion ... jacket and pendently supported ..., a lining disposed within and sub... ...ly coextensive with said jacket, and ...minuted body of heat insulating and ...absorbing material disposed between ...tainer and said lining for limiting ...ons of said container while permit... ...pansion thereof by changes of tem...

... heat-insulated vessel of the non... ...type, having an outer non-frangible ... provided with a neck and consisting ...rality of parts united by a circum... ...l spun seam, a strong inner frangi... ...tainer having a neck which is sealed ... neck of said jacket, and a packing ...-dispersing and heat-insulating ma... ...veloping said container and of suf... ...thickness to prevent indentations or ...ons of said jacket from exerting a ... pressure on said container, where... ...illation of said container is limited ... expansion thereof by changes of tem... ... permitted.

... heat-insulated vessel of the non... ... type having a non-frangible outer ..., an inner frangible container, and a ...iting said jacket and said container ... upper ends and sustaining said con... ... in a pendent position within said ..., said jacket and said container being ...ly spaced to prevent indented or ...d portions of said jacket from touch... ...d container.

... heat-insulated vessel of the non... ... type having a two-part outer jacket, ...r container of non-corrosive mate... ...ded directly to and pendently sus... ... by said outer jacket, and a commi... ...cking, disposed around said con... ...to limit pendulous movements of said ...r while permitting expansion and ...ion thereof by changes of tempera...

... heat-insulated vessel having a non... ...e outer jacket provided with a top ... and a bottom portion each formed ... cylindrical wall and united by a cir... ...ential joint, and an integral non-cor... ...inner container united to said top ... by an adherent bond, and supported ... bond in a pendent position.

... A heat-insulated vessel consisting of a divided outer jacket, a single-wall container, a bond directly uniting the tops of said jacket and said container and sealing the space within said jacket, and cushioning means, said cushioning means substantially filling the space between said jacket and said container and having low heat conductivity for insulating said container and for limiting pendulous movements thereof.

8. A heat-insulated vessel having an outer jacket and an inner container provided with a neck, a body of heat-insulating material surrounding said container and a closure for and engaging the neck of said container and separated from the inner wall of said neck by a heat-insulating air space.

9. A heat-insulated vessel having an outer jacket and an inner single-wall container provided with a neck, a body of heat-insulating material surrounding said container, a closure for the neck of said container separated from the inner wall of said neck, by a heat-insulating air space and a heat-insulating gasket disposed between said neck and said closure.

10. A heat-insulated receptacle of the non-vacuum type, including a multi-part outer jacket having an inturned portion at its upper end, a single-walled strong inner frangible container having a neck surrounded and laterally sustained by said jacket, and resilient heat-insulating material disposed between said jacket and said container and extending from the inner wall of said jacket to the outer wall of said container for limiting the oscillation of said container while permitting expansion thereof by changes of temperature.

11. A heat-insulated vessel of the non-vacuum type, having a non-frangible multi-part outer jacket, an inner strong single-walled container of low heat conductivity pendently sustained in and separated at all points from said outer jacket by heat-insulating material which limits oscillation of said container while permitting expansion thereof by changes of temperature.

12. A heat-insulated vessel of the non-vacuum type, having a non-frangible outer jacket, a strong inner single-walled frangible container of low heat conductivity pendently sustained in said jacket and separated at all points below the point of suspension in said outer jacket by heat insulating material for limiting oscillation of said container while permitting expansion thereof by changes of temperature.

13. A heat-insulated receptacle of the non-vacuum type, including a non-frangible outer jacket, a strong inner vitreous container supported in the upper portion of said outer jacket, and a comminuted heat-insulating material disposed between said jacket and said container for limiting oscillation of said container while permitting expansion thereof by changes of temperature, said container having sufficient opacity to substantially conceal said insulating material.

14. A heat-insulated receptacle of the non-vacuum type, having a non-frangible outer jacket, a strong inner single-walled container of frangible material, said inner container being pendently sustained in said

jacket, and heat-insulating and shock-absorbing means surrounding said container for limiting its oscillation while permitting expansion thereof by changes of temperature.

15. A heat-insulated receptacle including an inner vitreous container, a sectional outer jacket, heat insulating material disposed between said container and jacket, and a retainer for holding said insulating material in place pending the placing in position of a section of the outer jacket.

16. A heat-insulated receptacle of the non-vacuum type, including an outer non-frangible jacket, a strong inner vitreous container supported in the upper portion of said jacket, and heat insulating material disposed between said container and said jacket for limiting oscillation of said container while permitting expansion thereof by changes of temperature, said container having an outside coating of silver to render it opaque and reflective of heat rays.

17. A heat-insulated receptacle of the non-vacuum type, including a multi-section outer jacket, a strong vitreous single-walled inner container sustained in the upper portion of said outer jacket, resilient heat-insulating material disposed between said jacket and said container for limiting oscillation of said container while permitting expansion thereof by changes of temperature, one section holding a cover, and a seal to prevent moisture from reaching said insulating material.

18. A heat-insulated receptacle of the non-vacuum type, including a multi-section outer jacket, a strong vitreous single-walled inner container sustained in the upper portion of said outer jacket, resilient heat-insulating material disposed between said jacket and said container for limiting oscillation of said container while permitting expansion thereof by changes of temperature, a screw-threaded section for holding a cover, and a seal for preventing moisture from reaching said insulating material.

19. A heat-insulated receptacle including a multi-section outer metallic jacket, a vitreous inner container, heat-insulating material disposed between said jacket and said container, and a vitreous stopper carrying a resilient gasket, said stopper being retained in position by a cup engaged with a section of said outer jacket.

20. A heat-insulated receptacle including a multi-section outer metallic jacket, an opaque vitreous inner container, heat-insulating material disposed between said jacket and said container, and a vitreous stopper having a recess carrying a resilient gasket, said stopper being retained in position by a cup engaged with a section of said outer jacket.

21. A heat-insulated receptacle of the non-vacuum type, including a multi-section outer jacket, a vitreous open-mouth single-walled inner container sustained in the upper portion of said outer jacket, resilient heat-insulating material disposed between said jacket and said container for limiting oscillation of said container while permitting expansion thereof by changes of temperature, and an insulated stopper for closing the mouth of said container, a section of said outer jacket having means for holding and vertically adjusting a cover.

22. A heat-insulated receptacle of the non-vacuum type, including a non-frangible outer jacket, a strong inner frangible container having a body portion and a neck, said neck being held laterally by an upper part of said receptacle, and additional means for laterally holding said body portion and for restricting convective air currents around said container, said means consisting of comminuted heat-insulating material surrounding said body portion to thereby substantially prevent lateral movements of said body portion.

23. A heat-insulated receptacle of the non-vacuum type, including a non-frangible outer jacket, an inner frangible container having a neck, the neck of said container being laterally positioned by an adjacent part of said jacket, and the body of said container being laterally sustained in the body of said receptacle by a mass of comminuted heat-insulating material disposed in the space between said bodies to restrict convective currents of air therein and to limit the amplitude of pendulous movements of the body of said container.

24. A heat-insulated receptacle of the non-vacuum type, including a non-frangible outer jacket, a strong inner frangible container positioned at its upper end by an adjacent part of said jacket, and heat insulating material disposed within said jacket filling the space between said jacket and said container and of sufficient density to substantially prevent said container from whipping, vibrating or oscillating at its lower end.

In testimony whereof he affixes his signature in the presence of two witnesses.

LEWIS VAN BEVENTER BAIR.

Witnesses:
CARL J. POWERS,
B. E. FACTOR.

M. M. CLARK.

Milk Cooler.

No. 46,646. Patented Mar. 7, 1865

Fig. 1.

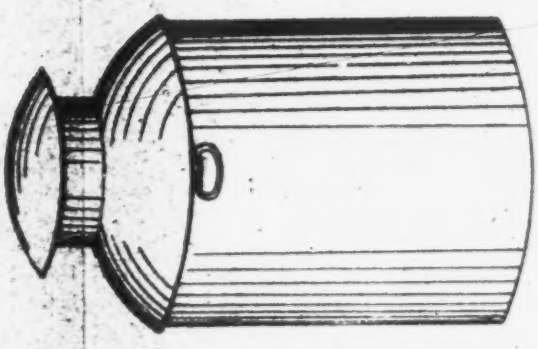


Fig. 2.

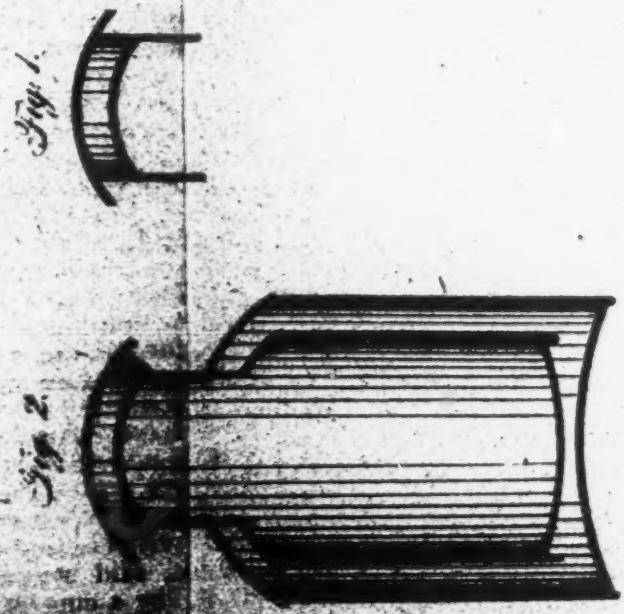
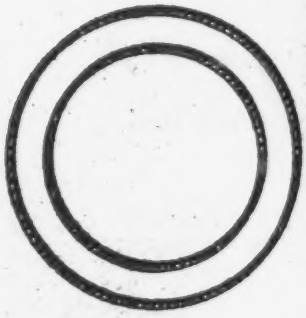


Fig. 3.



UNITED STATES PATENT OFFICE.

MOSES M. CLARK, OF MONROE, NEW YORK.

IMPROVED CAN FOR PRESERVING AND TRANSPORTING MILK.

Specification forming part of Letters Patent No. 46,640, dated March 7, 1865.

all whom it may concern:

Be it known that I, MOSES M. CLARK, of Monroe, Orange county, and State of New York, have invented a new and useful Method of Preserving Milk in Cans; that the title to such cans as given by me is "Clark's Milk-preserver;" and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawings, making a part of this specification.

Figure 1 represents the cover of the can, and the space shown on the design of such cover is to be filled in with pulverized charcoal and closed up, as shown upon the drawings. Fig. 2 represents the can in its sectional view, there being an inner and outer can or casing, and the space between them being filled in with pulverized charcoal. Fig. 3 represents the bottom of the can as open, the design, however, being, as soon as the can is filled in with pulverized charcoal, to close up the said bottom in a secure and permanent manner. Fig. 4 represents the can as completely finished.

The design of the said invention is to manufacture cans for milk, to be filled in all around with pulverized charcoal, as shown on the said drawings.

The invention I claim is—

The filling in of milk-cans between the inner and outer covers with pulverized charcoal, as a means of preserving milk, in such a manner as to protect the milk from heat.

New York, February 7, 1865.

MOSES M. CLARK.

Witnesses:

DAVID MCADAM.

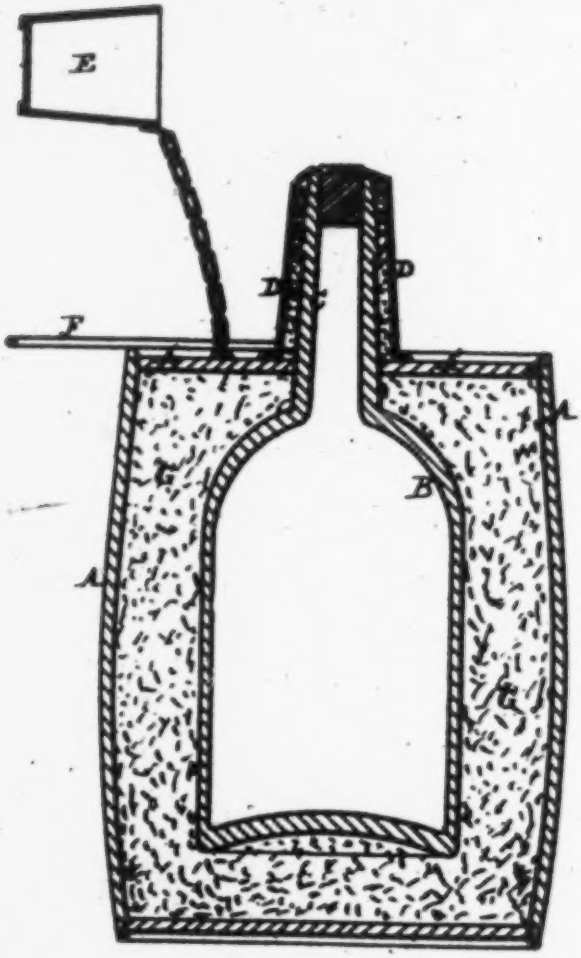
M. E. CLARK.

352

J. C. MOORE.

DEMIJOHN.

No. 184,256. Patented Nov. 14, 1876.



Witnesses

Albert E. Gaebele

Ralph P. Baby

Inventor

James C. Moore

per George J. Buckley

atty.

UNITED STATES PATENT OFFICE.

JAMES C. MOORE, OF PHILADELPHIA, PENNSYLVANIA.

IMPROVEMENT IN DEMIJOHNS.

Specification forming part of Letters Patent No. 184,256, dated November 14, 1876; application filed October 7, 1875.

To all whom it may concern:

Be it known that I, JAMES C. MOORE, of Philadelphia, Pennsylvania, have invented a new and useful Improvement in Demijohns; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the annexed drawing, making part hereof.

My invention consists of a demijohn formed by the combination of an outer protective casing, an inner contained bottle, flask, can, or jar, the neck of which pierces and projects through and above the head with which the casing is provided, and a supplemental collar or sleeve-casing set upon said head, and closely surrounding about equidistantly said neck, so that the supplemental casing forms a neck to the main casing, which will allow the contents of the bottle to be poured out as conveniently into a small-mouthed receiver on one side as on another, the said cap being constructed and arranged substantially as will be hereinafter more fully described.

To enable others skilled in the art to make and use my invention, I will describe its construction and operation.

In the drawing is shown a vertical cross-section of my demijohn.

A is the outer casing of wood; B, the inner contained bottle; C, the neck of the bottle projecting through the head A′ of the outer casing. D is the cap fitting around the neck C to save it from concussion from without. E is a cap or lid to cover the top of cap D and the mouth-piece of bottle B. F is the handle of the demijohn; G, packing between the outer casing and the bottle. The outer casing A is to protect the inner contained vessel in shipment, and in case this vessel is of glass, and other fragile substances, I prefer to use packing G. I leave an annular space between cap D and neck C, to save the latter from fracture by concussion through cap c.

When neck C is fragile I fill this annular space with packing. The packing used may be sawdust, bran, shavings, or other suitable material. The casing A and A′ I make of wood—cap D and cover E of sheet metal or tin. When vessel B is made of tin or other tough or fibrous material it may rest on the lower head of casing A, if desired, and the packing may be dispensed with. Care should then be taken that it fits tightly, so as not to shake. It may be made also to touch the inner sides of casing A. Cap D is secured to head A′ by a lower flange and screws, tacks, or other convenient means.

The projection of the neck through the head A′ is for convenience in pouring out the contents of the bottle, flask, can, or jar contained within the casing A. The mouth of bottle B is stopped by a cork, or any ordinary means.

I am well aware of the device shown in the patent dated June 18, 1872, No. 128,109; but that I do not claim. In the device there shown the neck of the inner contained flask does not project clear of the surrounding casing.

My cap is so arranged as to leave a slight annular chamber around the projecting neck, so as to protect the latter from concussion upon the outside of the cap; but this feature is comparatively unimportant, as the cap may be made of wood or other material which will deaden the force of a blow upon it.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

A demijohn formed by the combination of an outer protective main casing for the body of the contained flask, an inner contained bottle, flask, can, or jar, the neck of which pierces and projects through and above the head with which the main casing is provided, and a supplemental sleeve-casing set upon said head and closely surrounding about equidistantly said neck, so that the supplemental casing forms a narrow neck to the main casing, substantially as and for the purposes described.

JAMES C. MOORE.

Witnesses:

CHAS. H. ROBERTS,

ALBERT R. ZACHERLE.

356

E. A. HEATH.

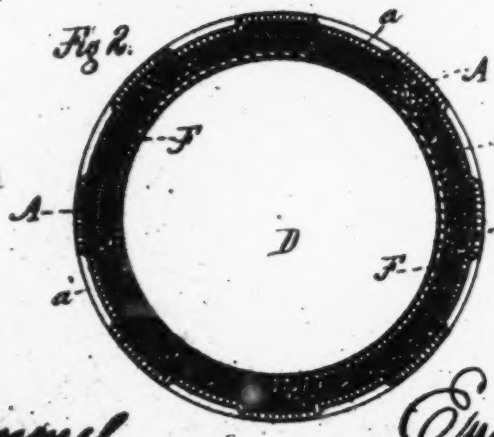
Encased Bottle.

No. 211,092. Patented Jan. 7, 1879.

Fig 1



Fig 2.



Witnesses:

Chas Hummel

E. G. Ward

Inventor:

Eugene A. Heath

by Dewey & Co Attorneys

UNITED STATES PATENT OFFICE.

EUGENE A. HEATH, OF NEW YORK, N. Y.

IMPROVEMENT IN INCASED BOTTLES.

Specification forming part of Letters Patent No. **211,092**, dated January 7, 1879; application filed December 28, 1877.

To all whom it may concern:

Be it known that I, EUGENE A. HEATH, of the city, county, and State of New York, have made certain new and useful Improvements in Incased Bottles for Transporting Fluids, of which the following is a specification:

This invention relates to that class of bottles which are provided with an exterior casing, a suitable packing being interposed between the two, the object sought for being the prevention of breakages during transportation.

The present invention consists in incasing the bottle in a light metallic case, the contour of which follows closely the configuration of the bottle, a space being left between the bottle and the casing, which is filled with soft packing, the base of the bottle also being covered, the bottom of the casing being securely closed by means of a metal bottom. The mouth of the bottle and its stopper are slightly projected above the neck of the casing, such neck being provided with a removable cover or cap, the entire arrangement forming a permanent bottle and case, which may be used generally in the same manner and in place of the common bottles, at the same time being well adapted for all shipping purposes without requiring any additional protection.

In the drawings, which form an essential part of this specification, Figure 1 represents a vertical sectional elevation of an incased bottle in which my invention is fully embodied; and Fig. 2 is a cross-section of the same, taken on line X X, in Fig. 1.

The same reference-letters marked on both drawings will locate and designate corresponding parts.

The object of my invention is to provide an incased bottle which presents to the eye an appearance similar to that of an ordinary bottle, that is capable of being used in place thereof for all general purposes, and at the same time be absolutely unbreakable. Such bottle may also be transported without boxing, and will insure the perfect delivery of its contents.

In carrying out my invention I prepare from sheet metal of suitable gage for the purpose the exterior casing, into which the bottle is to be inserted, secured, and packed. This casing A is formed by any of the usual mechanical processes of manipulating sheet metal. It may be struck up in dies, spun, or drawn into shape, or so partially shaped and finished by other processes. The shape of this casing preferably partakes after the general exterior configuration of the bottle, as shown in Fig. 1, and its walls may be smooth, or may be recessed, paneled, or corrugated below the breast, as may be preferred.

In Fig. 2, I have shown the casing as corrugated, and such corrugations may be varied in number and be large or small, as may be deemed best. The apex of the breast of the casing is so drawn or shaped as to form a projecting-neck, B, the base of which has formed upon its exterior a screw-thread, *b*, which may be spun thereupon by means of any suitable tools.

A cap, C, the base of which is also provided with a screw-thread, *c*, corresponding with the screw-thread *b* on the neck of the casing, is arranged for application to such neck in order to cover the mouth of the bottle. This cap may be struck up or drawn from sheet metal and the screw-thread spun thereupon in the manner usually adopted in such cases. A suitable soft lining or packing, *h*, may be inserted into the top of said cap in order to prevent the bottle-stopper from coming in contact with the metal of the cap.

A sheet-metal bottom, G, either with or without a flange, is provided for insertion in the base of the casing A, and is permanently secured therein after the bottle and packing are in place.

D represents the bottle, which is inserted into the case A from its opened base, the apex or mouth of the bottle passing out of the open top of the neck of the case. The metal at the top of the neck B, above the screw-thread, is then pressed inwardly, so as to close firmly around the neck of the bottle, which may be flanged, as shown. Various methods of closing in the metal of the neck B will readily suggest themselves to the skilled artisan, and I therefore do not limit myself to any specific device.

The casing A is made of such size that after the bottle is inserted therein a space is left on all sides between the two, which space is then filled with any suitable soft packing

or filling. Various substances may be used, although I prefer to use fine cork chips. This filling covers the bottle completely, including the neck, also the bottom thereof. The metal bottom G is then inserted, pressed down upon the packing, and secured in place by soldering, which completes the package.

It is apparent that a bottle so incased is immovably in place and secure from any danger of breakage, as at no point can it come in contact with any ordinary breaking causes. This incased bottle is specially adapted for general use, and the exterior of the case may be highly ornamented by plating or painting, and its sides may be plain or paneled or corrugated, as described.

What I claim as my invention is—

1. The combination, substantially as described, of a glass bottle, a light metal casing formed in one piece, the configuration of which is substantially that of the bottle, such casing being of greater size than the bottle, a soft filling or packing interposed between the two, and a light metal bottom for finally closing the base of said case and retaining the bottle therein,

2. The combination of the bottle D, the filling or packing F, the metal casing A, formed in one piece, having neck B, provided with screw-thread *b*, metallic bottom G, and cap C, all arranged and applied as and for the purposes substantially as herein shown and set forth.

EUGENE A. HEATH.

Witnesses:
A. L. MUNSON,
E. G. WARD.

360

(No Model.) 2 Sheets—Sheet 1.

C. E. CLISBEE.

INSULATED CAN.

No. 358,732. Patented Mar. 1, 1887.

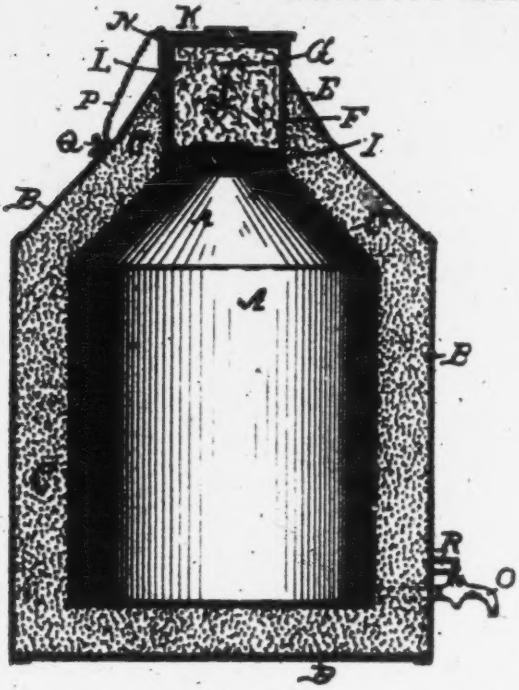


Fig. 1.



Fig. 2.

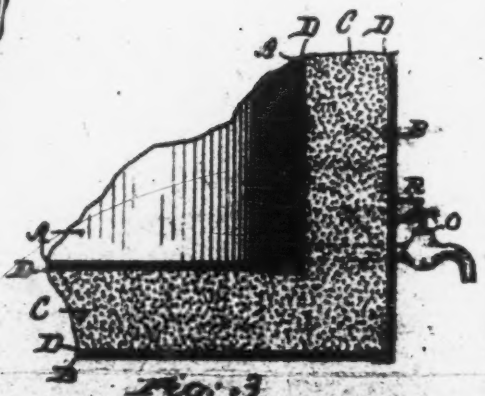


Fig. 3.

Witnesses:

Inventor
Clarence E. Clisbee
by A. F. Pierce
attorney

(No Model.) 2 Sheets—Sheet 2.

C. E. CLISBEE.

INSULATED CAN.

No. 356,732. Patented Mar. 1, 1887.

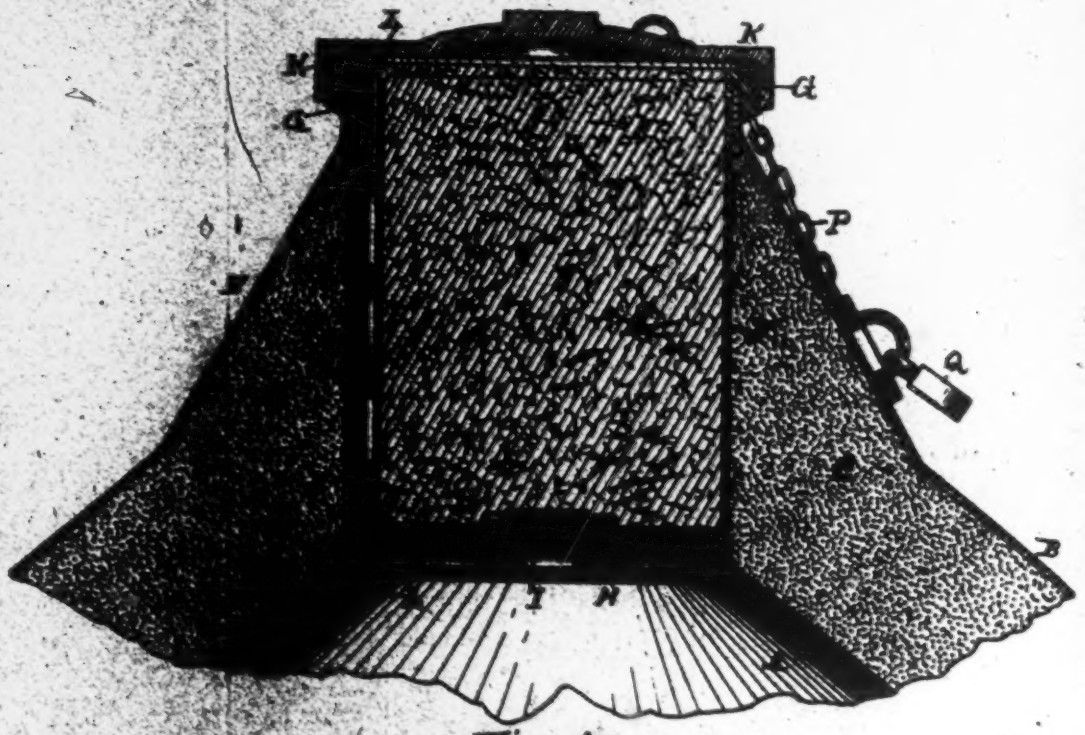


Fig. 4.

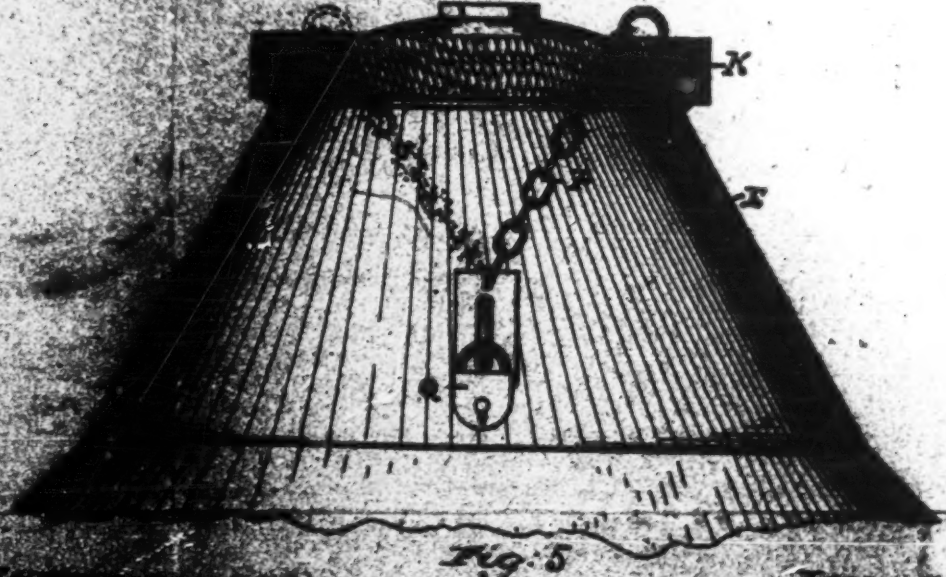


Fig. 5.

UNITED STATES PATENT OFFICE.

CLARENCE E. CLISBEE, OF BOSTON, MASSACHUSETTS.

INSULATED CAN.

SPECIFICATION forming part of Letters Patent No. 358,732, dated March 1, 1887.

Application filed October 14, 1886. Serial No. 216,291. (No model.)

To all whom it may concern:

Be it known that I, CLARENCE E. CLISBEE, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Insulated Cans, of which the following, taken in connection with the accompanying drawings, is a specification.

The object of this invention is to furnish an improved insulated can for coffee and other beverages, packed in its body and top to resist radiation, so that the liquid may retain heat for twenty-four hours or more; and, also, to provide a vent-tube opened or closed by a slight rotary movement of the screw-cap, which movement is limited, so that the cap cannot be removed by unauthorized parties. The faucet is controlled by a seal to prevent any tampering with the contents of the can.

In the drawings, Figure 1 is a vertical section through my improved can; Fig. 2, an enlarged detail view of the top of the can; and Fig. 3, a like view of the body, showing its double wall and paper lining. Fig. 4 is an enlarged vertical section through the top or mouth of the can, showing the vent-tube uncovered by the turn of the screw-cap; and Fig. 5 an external view of the top.

The body of my improved can consists of two concentric cylindrical vessels, A and B, made, by preference, of a frusto-conical form in the upper portion. Between these vessels, at the base and all around, the space is filled with non-conducting filling, C, preferably of kiln-dried sawdust rammed hard and firmly packed. The inner vessel, A, is of copper tinned on the inner surface to resist corrosion, while the outer vessel is of heavy tinned or galvanized iron strengthened by external hoops. These supports may also re-enforce its bottom.

As an additional and most effective guard against radiation of heat, I apply to the entire outer surface of the inner vessel, and preferably to the inner surface of the outer vessel, one or more layers of stout paper, D, or other equivalent non-conducting material, and I find that by thus coating the sheet-metal body I can keep by several hours the time during which the coffee is kept hot as compared with former practice without such coating.

The can top or mouth is peculiar in some respects. Its outer wall, E, tapers upwardly to meet the upper edge of a cylinder, F, which is a vertical extension of the reduced top of the inner vessel, A. The space inclosed between E and F is packed with the filling C. A threaded ring, G, forms the upper edge of this top.

At the lower edge of the cylindrical part F a shoulder, H, projects inwardly to support a cork or other non-conducting plug, I, provided with a suitable handle for lifting it out when desired. Above this plug the space is filled up to the top of the ring G with mineral wool or like packing J, either inclosed in a bag or filled in and pressed down without such flexible receptacle. By this construction I keep the heat from radiating at the top, and the cap K, which screws onto the ring G, will remain cool for hours longer than has been possible heretofore.

L represents a vent-tube secured within the cylinder F and extending from the air-space within the can up flush with the upper edge of the screw-ring G. The screw-cap K has an annular flange, N, which projects inwardly and bears upon the upper end of the vent-tube L, shutting off all ingress of air. A partial turn of the screw-cap opens the vent and permits the liquid to be drawn from the faucet O. I limit the movement of the cap at this point by extending a chain, P, from it to a staple with padlock Q and a key to secure the other end to the can.

I provide a rest, R, for the faucet-handle to check its closing movement at the proper point, and in shipping filled cans I affix a metallic seal of any suitable pattern to secure the handle to its rest, so as to guard against drawing off the beverage in transit.

The can is provided with suitable lifting-handles. The edges of the cap K are milled or roughened, and at the top I form an angular protuberance, to which a wrench may be applied.

I claim as my invention—

1. The described can having a top or mouth formed of the tapering wall E and cylinder F, with interposed packing J and terminal screw-ring G, and with [illegible] vent-tube L, fixed within the cylinder, in combination with

the plug I, the superposed packing J, and the screw-cap K, each separately removable from the can-mouth, substantially as set forth.

2. In an insulated can, the top provided at its upper edge with the screw-ring G, and having a vent-tube, L, fixed within it, in combination with the screw-cap K, adapted to open and close such vent, and with suitable means of limiting the movement of the cap, for the purpose set forth.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, on this 8th day of October, A. D. 1886.

CLARENCE E. CLISBER

Witnesses:
N. H. SPENCER,
FRANK T. BENNER.

866

(No Model.)

J. W. FOX.

CARBOY FOR ACIDS.

No. 438,149. Patented Oct. 14, 1890.

Fig. 1.

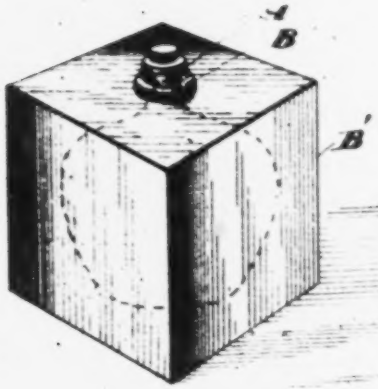
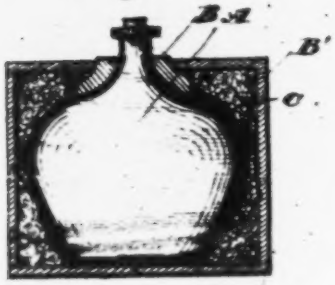


Fig. 2.



Witnesses
Wm. A. Moore.
F. H. Moore

Inventor
John W. Fox.
A. S. Thurman
Attorney

UNITED STATES PATENT OFFICE.

JOHN W. FOX, OF CLEVELAND, OHIO.

CARBOY FOR ACIDS.

SPECIFICATION forming part of Letters Patent No. 438,149, dated October 14, 1890.

Application filed December 28, 1889. Serial No. 335,267. (No model.)

To all whom it may concern:

Be it known that I, JOHN W. FOX, a citizen of the United States, residing at the city of Cleveland, in the county of Cuyahoga and State of Ohio, have invented a certain new and useful Improvement in Carboys, intended to be used for the purpose of safely handling and transporting nitric and other powerful acids, of which the following is a specification.

Heretofore in the handling and transportation of such acids much danger, loss, and damage to persons and property have been occasioned by the breakage of the carboys and other vessels in which such acids have been put up for handling and transportation, and great loss and damage by fire have been occasioned by contact of the contents of the carboys when broken with the inflammable materials used for packing, and frequently thereby persons have been seriously injured, and railroad-cars and other property used in the transportation of the same have been seriously damaged and oftentimes wholly destroyed.

The object of my invention is to provide an improved carboy intended to contain powerful acids, whereby danger, damage, and loss from breakage and fire may be reduced, if not wholly overcome.

In the accompanying drawings, Figure 1 is a perspective view of a frame or box inclosing the carboy, showing the neck thereof projecting through said frame or box. Fig. 2 is a vertical sectional view of one form of carboy, packing, and frame.

To enable others skilled in the art to which my invention relates, I do hereby declare the following to be a full, clear, and exact description of said invention.

A is any ordinary glass carboy or other vessel suitable for the handling and carriage of powerful acids.

B is a frame or box of wood or other suitable material, inclosing the carboy A, and a space between the inside surface of the frame and the exterior surface of the carboy.

C is a packing of mineral wool or other suitable material, to fill said space. The wool is soft and pliable and makes an excellent packing to prevent breakage, and in addition to these properties it has the advantage and value over ordinary packing material used for a like purpose in that it is wholly fire-proof and non-combustible, so that in case of any breakage or leakage of the carboy the acid contents thereof coming in contact with such mineral wool and being absorbed thereby are prevented from causing injury to the person handling the package and loss or damage by fire to the car or vehicle in which it is being transported, or to other packages with which the same may be in contact.

I do not limit myself to the use of mineral wool, for it is evident that any other fire-proof and non-combustible material suitable to be used for packing may be substituted in my invention for mineral wool.

B is a packing of plaster-of-paris or other suitable material, intended to hold the carboy firmly in place within the box or frame inclosing it and to exclude water or moisture from the packing C.

The carboy A, when inclosed in the box or frame B, will ordinarily have its neck projecting through a hole in said box or frame. This neck of the carboy is liable in the handling or transit of the package to be fractured or broken against the side of the box or frame from which it projects, and moisture or water is liable to penetrate to the packing C through this hole in the box around said neck, and in such case the packing C is liable to freeze in cold weather, and when so frozen any rough handling of the package may cause breakage of the carboy. Around this neck of the carboy I tightly pack plaster-of-paris or other suitable material, as shown at B, for the purpose of firmly holding the carboy in place within the box or frame, thus decreasing the danger of breakage while the package is being handled or in transit, and also for the purpose of excluding moisture or water, and thus preventing breakage of the carboy caused from freezing of the packing material C in cold weather.

I do not limit myself to any particular form of carboy or vessel containing the acid or to any particular kind or form of box or frame inclosing the carboy or vessel.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

The combination, with a carboy or vessel of glass or other suitable material containing nitric or other powerful acid and the frame or box within which the same is inclosed, the space between such box and the carboy being packed with mineral wool or other suitable fire-proof soft packing material, of a [illegible] of plaster-of-paris around the neck of the carboy, substantially as and for the purpose shown and described.

JOHN W. FO[illegible]

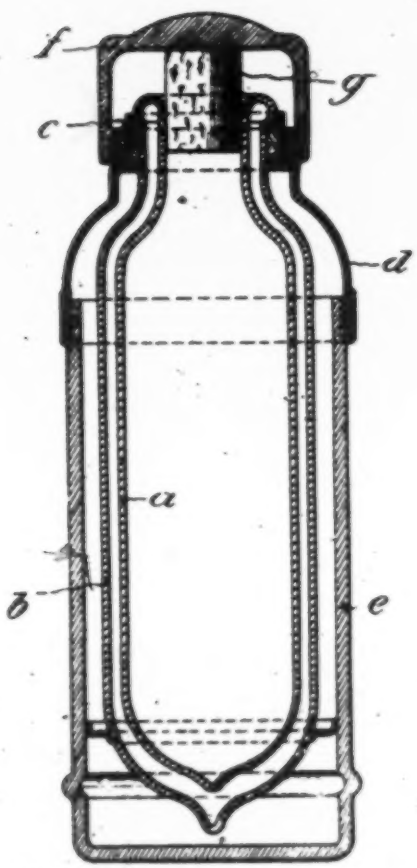
Witnesses:
F. T. SHOLES,
S. R. HARRISON.

No. 884,582. PATENTED APR. 14, 1908.

H. HENN.

VESSEL WITH DOUBLE WALLS AND PROTECTIVE CASE.

APPLICATION FILED OCT. 18, 1907.



Witnesses.
W. Britton
F. George Berry

Inventor
Herbert Henn
by attorneys
Howson & Howson

UNITED STATES PATENT OFFICE.

BERT HENN, OF BERLIN, GERMANY, ASSIGNOR, BY MESNE ASSIGNMENTS, TO AMERICAN THERMOS BOTTLE COMPANY, OF BROOKLYN, NEW YORK, A CORPORATION OF MAINE.

VESSEL WITH DOUBLE WALLS AND PROTECTIVE CASE.

No. 884,582. Specification of Letters Patent. Patented April 14, 1908.

Application filed October 18, 1907. Serial No. 398,048.

ll whom it may concern:

Be it known that I, HUBERT HENN, mer-ant, residing at No. 44 Schönhauser-Allee, rlin, Germany, a subject of the King of ussia, German Empire, have invented a w and useful Improved Vessel with Double alls and Protective Case, of which the llowing is a full, clear, and exact specifica-n.

The present invention relates to vessels th double walls which inclose in a well own manner a space in which a vacuum ists. Such vessels have hitherto been fas-ned in a protective jacket of any material in uitable manner, for example by fastening e neck of the vessel with plaster of paris in e upper part of the protective jacket. As e protective jacket in itself is likewise gid, it is very difficult to introduce a new uble-walled vessel into the protective cket if the former is destroyed by accident. oreover, the mode of fastening the vessel y securing it with plaster of paris or the like hitherto adopted does not by any means tisfy requirements with regard to security d cleanliness. It has not been possible remove the liquid in a clean and simple anner at the joint or the mouth of the ssel. Also it has not been in any way pos-ible to exchange the vessels easily when eaning the vessels or when a breakage has curred.

By means of the present invention the ssels can be easily exchanged by the vessels ing screwed into the upper members of e protective jackets by means of screw-reads on their necks or in the neighborhood their mouths.

A practical embodiment of my invention illustrated in the accompanying drawings hich represent the bottle, jacket and cup in rtical central section.

Of the double-walled vessel which con-ts of two walls *a*, *b*, inclosing the space in ich a vacuum exists, there is fastened a ar *c* on the upper part of the outer wall *b*, id collar being provided with a screw-hread. This threaded collar *c* which is stened by plaster of paris or the like below he edge of the mouth of the bottle, is crewed into the upper member *d* of the pro-ective jacket for the bottle. On the upper member *d*, a body member *e* is screwed, said ody member serving as the protective jacket proper for the vessel and at the same time serving to close the same. The upper member *d* is provided with another screw-thread which serves for screwing on the protective cup *f*. After screwing off said cup from the upper member and removing the cork *g*, the edge and outlet of the vessel are perfectly free so that on pouring out the liquid none of the latter can pass through the joint between the vessel and the protective jacket. By screwing off the body member *e*, the vessel can be very readily removed from the upper member and then be thoroughly cleaned by itself or in the case of a breakage, be readily replaced by another.

What I claim is:

1. The combination with a jacket composed of separable members, of a cup and a vacuum insulated bottle, both removably secured to one of said jacket members.

2. The combination with a jacket having an upper member and a body member having a screw threaded engagement therewith, of a vacuum insulated bottle also having a screw-threaded engagement with said upper jacket member.

3. The combination with a jacket having an upper member and a body member having a screw-threaded engagement therewith, of a cup and a vacuum insulated bottle, both having screw-threaded engagements with said upper jacket member.

4. The combination with a jacket having an upper member and a body member having a screw-threaded engagement therewith, of a vacuum insulated bottle having a collar at its neck provided with a screw-threaded portion arranged to engage the upper jacket member.

5. In combination, a vacuum insulated bottle, a cup and a jacket comprising an upper member and a body member removably secured thereto, said upper member having a screw-threaded portion, the inner wall of which is arranged to be engaged by the vacuum insulated bottle and the outer wall of which is arranged to be engaged by the cup.

Dated this 3d day of October, 1907.

In witness whereof I have hereunto set my hand in presence of two witnesses.

HUBERT HENN.

Witnesses:

WOLDEMAR HAUPT,

HENRY HASPER.

374

G. P. ALTENBERG.

DOUBLE WALLED VESSEL.

APPLICATION FILED DEC. 23, 1907.

900,075.

Patented Oct. 6, 19

Fig. 1.



Fig. 2.

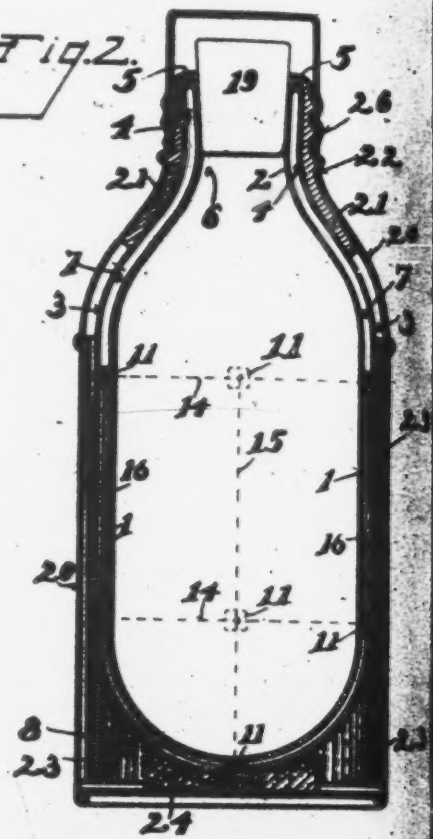


Fig. 4.

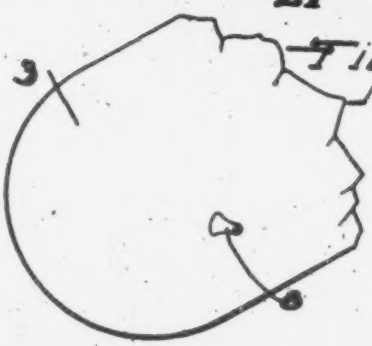


Fig. 3.

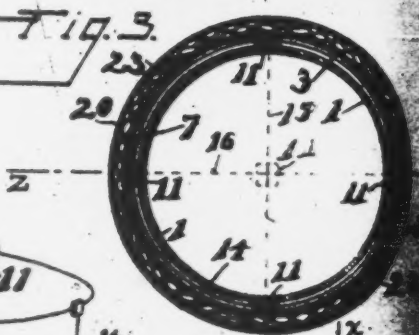




Fig. 6.

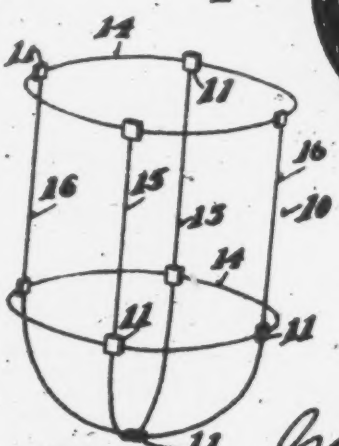


Fig. 5.



Fig. 7

Witnesses
Homer Bradford
Florence Quinn

Inventor

UNITED STATES PATENT OFFICE.

GEORGE P. ALTENBERG, OF CINCINNATI, OHIO.

DOUBLE-WALLED VESSEL.

No. 900,075. Specification of Letters Patent. Patented Oct. 6, 1908.

Application filed December 26, 1907. Serial No. 407,782.

To all whom it may concern:

Be it known that I, GEORGE P. ALTENBERG, a citizen of the United States, residing at Cincinnati, in the county of Hamilton and State of Ohio, have invented certain new and useful Improvements in Double-Walled Vessels, of which the following is a specification.

My invention relates to double walled vessels adapted to preserve the contents at substantially the temperature at which they have been placed in the vessel, for a considerable period of time, and the invention will be readily understood from the following description and claims, and from the drawing, in which latter:

Figure 1 is a front elevation of my improved device, partly broken away. Fig. 2 is a central vertical longitudinal section of the same, taken on a line corresponding to the line *x*—*x* of Fig. 3. Fig. 3 is a horizontal cross-section of the same taken on the line *y*—*y* of Fig. 1. Fig. 4 is a bottom perspective view of the vessel, partly broken away, with the outer casing removed. Fig. 5 is a perspective view of the basket holding the supporting pieces in place. Fig. 6 is a detail showing the connection between one of the supporting pieces and the wire of the basket, in section on a line corresponding to the line *z* of Fig. 7; and Fig. 7 is a similar detail on a line corresponding to the line *z* of Fig. 6.

[illegible] represents an inner member of the vessel [illegible] at its top for forming a neck 2, [illegible] an outer member of said vessel also [illegible] at its top for forming a neck 4, [illegible] necks being joined preferably approximately at their ends as shown at 5 for forming the combined neck 6 of the vessel. The [illegible] preferably takes place by fusing the [illegible] 4 or otherwise hermetically sealing [illegible]. The vessel is preferably formed [illegible] or other substance which is impervious to air. A space 7 is formed between the [illegible] of the vessel, this space surrounding the inner member. The air in this space is withdrawn or practically exhausted for forming a vacuum which in practice acts as a heat-insulating blanket for the inner member. For accomplishing the withdrawal of the air, I provide the outer member with a nipple 8 through which the air in the cavity is withdrawn, the nipple being sealed, as by [illegible], after withdrawal of the air and thereby sealing the vacuum which has been created in the cavity.

10 is a basket upon which supporting pieces 11 are held. The framing of the basket is preferably composed of wires, which I prefer to cover with a heat-insulating material 13, such as asbestos, shown in the form of cord wound about the wires. These supporting pieces are also of heat-insulating material, and I have found that asbestos forms a preferable material out of which these pieces are made. A heat-insulating separating or supporting medium is thus formed between the inner and outer members which permits expansion and contraction especially of the inner member without undue strain upon different parts of the same. The structure comprising the basket and supporting pieces thereon is supported from the outer vessel. My improved structure prevents unequal resistance upon different parts of the inner member, and acts as a support for the inner member without itself in turn depending for its support upon said inner member. In this manner fracture of the inner member at the neck or at other parts is avoided, the inner member being supported laterally and longitudinally for permitting its expansion and contraction relatively to the outer member, there being sufficient resiliency in the supporting pieces to permit this. I prefer that the basket shall comprise lateral wires 14 and longitudinal wires 15 16, which latter are bowed about the lower end of the inner member. At the junction between the lateral and longitudinal wires, one of them is twisted about the other as shown at 17, and at this junction the wires are bared of their insulating covering, as shown at 18 for reducing the size of the joint, the pieces being secured to the wires at the joints. The wires may cross at the bottom of the inner member without being twisted.

The vessel is adapted to be closed by a suitable stopper 19. A protecting casing 20 surrounds the vessel and is held with relation thereto at its top by a collar 21, which may be of plaster of paris for holding the neck of the vessel and the neck 22 of the casing in rigid relation. A packing 23 surrounds the vessel inside the casing and extends longitudinally of the same. I prefer this packing to be of corrugated straw-board. The bottom of the vessel is prefer-

ably supported on a felt pad 24. A releasable cup 25 takes about the neck 22 and is releasably secured thereto in suitable manner as by having screw-connection 26 therewith.

Having thus fully described my invention what I claim as new and desire to secure by Letters Patent is:

1. In combination, a double walled vessel comprising an inner member and an outer member having a heat-insulating space therebetween, a basket composed of wire located in said space and surrounding the lower part of said inner member, supporting pieces located between the side walls of said inner and outer members and a supporting piece between the bottom walls of said members, said supporting pieces being held in place by said basket.

2. In combination, a double walled vessel comprising an inner member and an outer member having a heat-insulating space therebetween, a basket composed of heat insulated wire located in said space and surrounding the lower part of said inner member, supporting pieces located between the side walls of said inner and outer members and a supporting piece between the bottom walls of said members, said supporting pieces being held in place by said basket.

In testimony whereof, I have subscribed my name hereto in the presence of two subscribing witnesses.

GEORGE P. ALTENBERG.

Witnesses:

EARLE R. PASSEL,

FLORENCE QUINN.

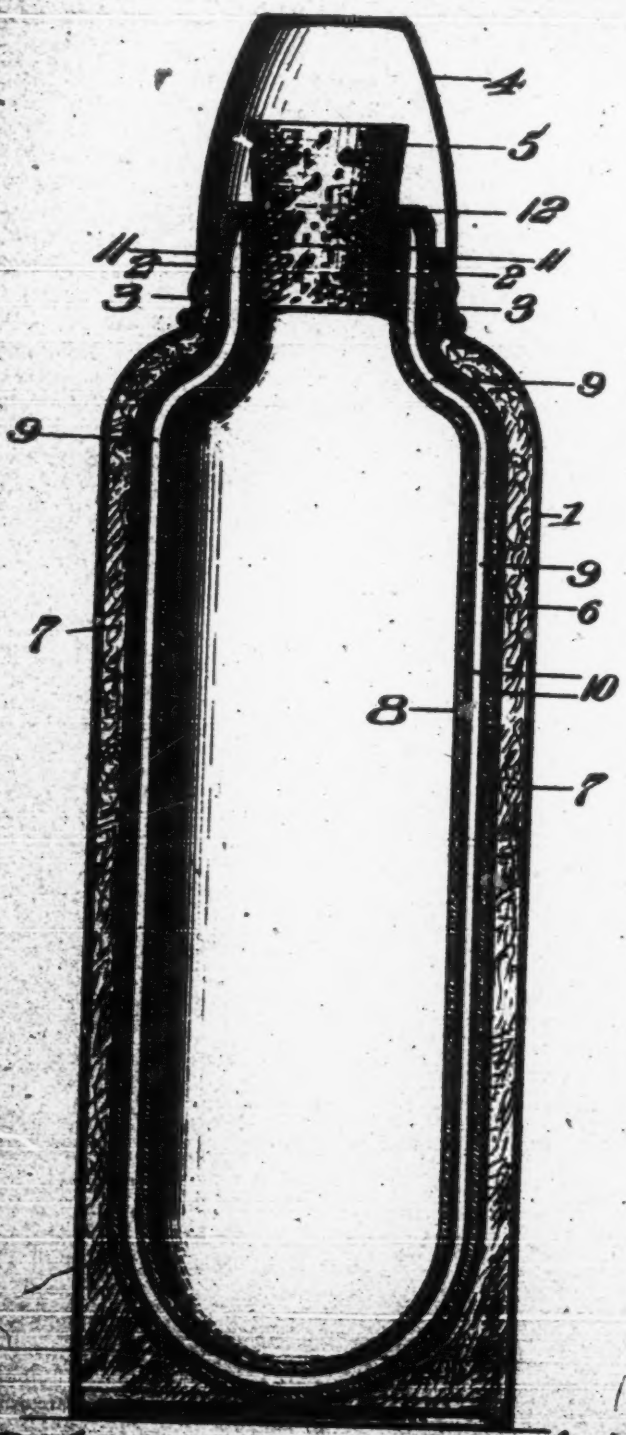
J. G. LYMAN.

VACUUM BOTTLE.

APPLICATION FILED AUG. 18, 1908.

923,174.

Patented May 18, 1909.



Witnesses

Inventor

John G. Lyman.

By Wiederhain & Lieb

Attorneys

UNITED STATES PATENT OFFICE.

JOHN G. LYMAN, OF PHILADELPHIA, PENNSYLVANIA.

VACUUM-BOTTLE.

No. 922,174. Specification of Letters Patent. Patented May 18, 1909.

Application filed August 18, 1908. Serial No. 448,027.

To all whom it may concern:

Be it known that I, JOHN G. LYMAN, a citizen of the United States, residing in the city and county of Philadelphia, State of Pennsylvania, have invented a new and useful Vacuum-Bottle, of which the following is a specification.

This invention relates to a new and useful receptacle for storing liquids so that the temperature of the same may be maintained substantially constant for a long period of time and the effectiveness of the receptacle be substantially unimpaired after long continued use.

It has for an object, to provide a receptacle of this type with a suitable discharge opening which is so arranged relative to adjacent parts as to prevent at any time, the contents of the receptacle from coming in contact with the insulating means inclosing the said receptacle.

It has for a further object, a novel arrangement of mouth opening for a receptacle operating on the vacuum principle, wherein a joining ring is located around the neck of the bottle in such a position that it does not form a collecting place for overflowing contents of the receptacle and the gathering of disease germs.

For the purpose of illustrating my invention, I have shown in the accompanying drawings one form thereof which is at present preferred by me, since the same has been found in practice to give satisfactory and reliable results, although it is to be understood that the various instrumentalities of which my invention consists can be variously arranged and organized and that my invention is not limited to the precise arrangement and organization of these instrumentalities as herein shown and described.

The figure represents a sectional elevation of a receptacle embodying my invention.

Similar numerals of reference indicate corresponding parts in the figures.

Referring to the drawings: 1 designates a casing for a receptacle embodying my invention, the same preferably being of metal or [illegible] material and having a neck 2 [illegible] and provided with a thread [illegible] threaded end of a cap 4 de[illegible] a cork 5 or other closing [illegible] located in the neck opening [illegible] designates the outer shell of a receptacle [illegible] same being protected from contact with the walls of the casing and relative displacement by means of suitable material 7 therebetween. The material is preferably a non-conductor of heat or cold and serves to maintain the contents of the receptacle at a substantially constant temperature—thus if the receptacle is filled with a liquid at a temperature approximating the boiling point, the material will resist the escape of any heat units. In the same manner the receptacle maintains the contents at a low temperature.

8 designates the inner wall of the same receptacle and is of similar contour to the outer shell 6 but located at a slight distance therefrom in order to provide a chamber 9 therebetween from which, in order to make an operative receptacle of the type to which my invention relates, the air is exhausted from the said space 9 forming a vacuum and a lining 10 is preferably provided within the same of quick silver or similar material. Of course, it will be understood by those skilled in the art that the insulating material 7 between the outer shell 6 and the casing 1 has to be securely sealed therein in order to prevent water or liquids leaking into this space and destroying in a large measure, the insulating effect of this material. For this purpose in the present instance, I employ a plaster-of-paris joining ring 11, located between the neck 3 of the casing 1 and the outer wall 6 of the liquid receptacle. It will be noted that as herein disclosed this joining ring 11 is located a slight distance below the mouth 12 of the interior receptacle so that when the cap 4 has been removed and the cork 5 withdrawn therefrom, the contents of the receptacle may be readily poured out without danger of the liquid or like containing substance flowing down on to the joining ring 11. Attention is called to the fact that the ring 11 is located below the mouth of the bottle and between the upper end of the casing and the neck portion of the bottle, the top of the ring terminating substantially at the same level as the top edge of said casing, whereby the ring is protected and the appearance of the bottle is preserved as well.

Attention is especially directed to the mouth opening 12 in that the same projects a distance beyond the neck 2 of the casing 1 and the vacuum space 9 is also carried up therewith forming an insulation interior of the packing ring 11. It will be readily apparent in receptacles having the mouth of

the inner wall substantially flush with the packing [illegible] that a surface is exposed to the [illegible] of the receptacle when poured out [illegible] as a collecting place for germs [illegible] and the like. Furthermore, this type of receptacle is very hard to sterilize properly as the heated contents are absorbed by the packing material and open crevices which cannot be efficiently cleaned.

By my novel [illegible] opening I protect the joining from contact with the contents of the receptacle and provide a vessel which can be sterilized throughout and furthermore the vacuum extends sufficiently to form an insulation between the joining and the interior of the receptacle.

It will be readily apparent that I have devised a very novel and useful means of protecting the insulating material 7 of the bottle which has heretofore gradually become permeated with the overflow from the receptacles and its usefulness destroyed as a heat and cold retaining means.

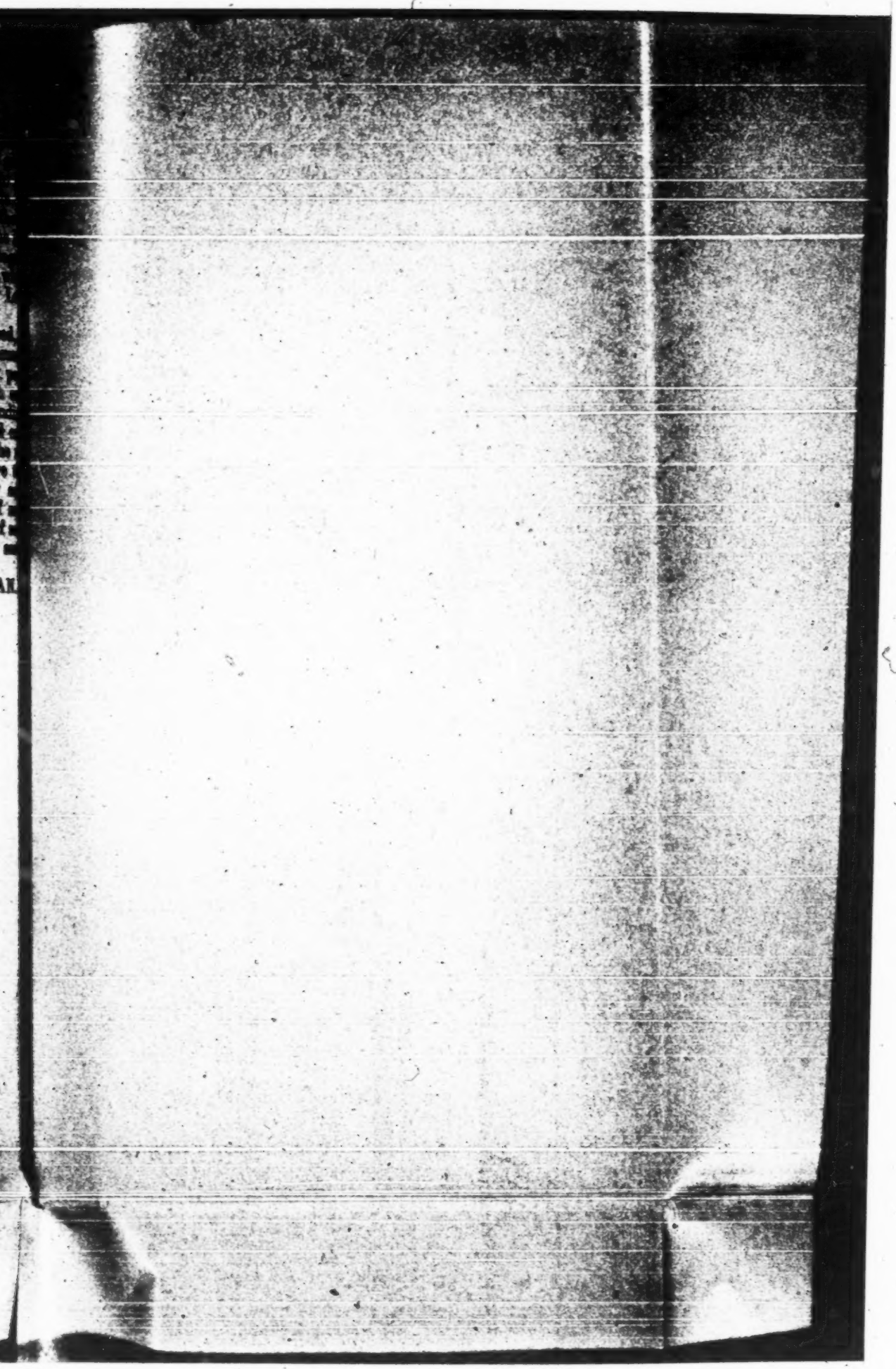
It will now be apparent that I have devised a novel and useful construction which embodies the features of advantage enumerated as desirable in the statement of the invention and the above description and while I have in the present instance shown [illegible] scribed the preferred embodiment [illegible] which has been found in practice [illegible] satisfactory and reliable results, it [illegible] understood that the same is susce[illegible] modification in various particulars [illegible] departing from the spirit or scope of [illegible] vention or sacrificing any of its adva[illegible]

Having thus described my inventio[illegible] I claim as new and desire to secure by [illegible] ters Patent, is:—

In a device of the character describ[illegible] double walled receptacle having a va[illegible] therebetween and formed with a neck [illegible] tion extending upwardly to the mouth [illegible] of uniform diameter, a casing surrou[illegible] said receptacle, the upper edge of said [illegible] ing terminating below the mouth of the [illegible] ceptacle, said vacuum extending above [illegible] said edge, and a ring located below [illegible] mouth and between the upper end of [illegible] casing and said-neck portion, the top of [illegible] ring terminating substantially at the [illegible] level as the top edge of said casing.

JOHN G. LYMAN

Witnesses:
C. D. McVay,
L. H. Brewington.



R. BURGER & A. ARCHENBRENNER.

FIELD OR HUNTING FLASK.

APPLICATION FILED MAR. 10, 1909.

Released Nov. 15, 1910.

13,093.

Fig. 2.



Fig. 4.

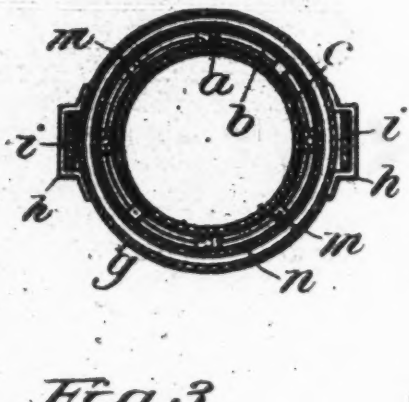


Fig. 1.

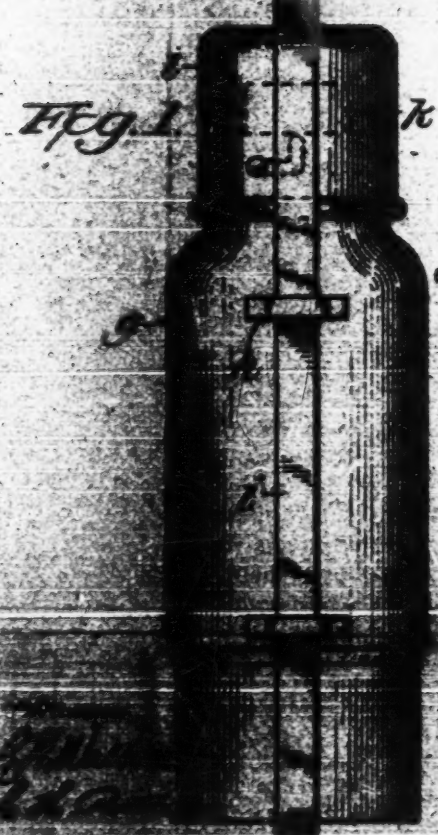
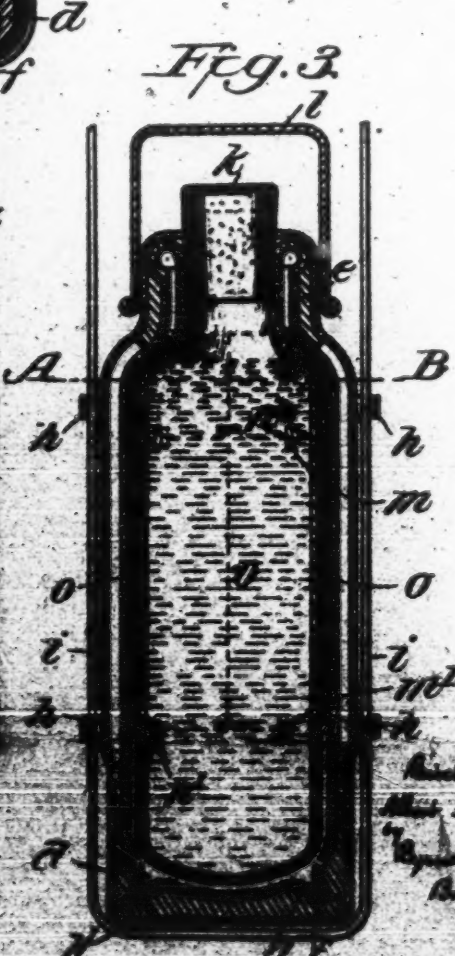


Fig. 3.



Witnesses:

Inventors:

NITED STATES PATENT OFFICE.

LD BURGER AND ALBERT ASCHENBRENNER, OF BERLIN, GERMANY, ASSIGN-
TO AMERICAN THERMOS BOTTLE COMPANY, OF NEW YORK, N. Y., A CORPORA-
TION OF MAINE.

FIELD OR HUNTING FLASK.

Specification of Reissued Letters Patent. Reissued Mar. 15, 1910.

tent No. 890,847, dated May 8, 1908, Serial No. 322,254. Application for reissue filed March 15, 1909. Serial No. 483,658.

all whom it may concern:

Be it known that we, REINHOLD BURGER and ALBERT ASCHENBRENNER, subjects of the ing of Prussia, German Emperor, residing Berlin, Germany, have invented certain w and useful Improvements in Field or unting Flasks, (for which we have ob-ined a patent in Great Britain, numbered 21, A. D. 1904, and in France, numbered 0,037;) and we do hereby declare that the llowing is a full, clear, and exact descrip-on of the same.

This invention relates to field or hunting sks for the conveyance and storing of uids, more particularly of beverages. essels of a similar kind are already known d have been used for other purposes; but ey have not the characteristic shape of r improved bottle and are not provided ith a protective jacket.

Another feature of our invention consists the fact that a layer of heat-insulating aterial is arranged in peculiar manner be-ween the two glass walls in order to pre-ent the breaking of the glass by concussions the like at that part where the inner wall the bottle is connected with the outer all—that is to say, at the neck of the ttle. Special novel means for this purpose ill be described hereinafter.

Another feature of the invention consists the fact that the tubes for evacuating the ttle are not arranged at the center of the ttom, but at the side thereof, so that it n be more effectually protected from in-ry and that the bottle and its jacket can be ven a more suitable shape.

The invention is illustrated in the an-red drawings, in which similar letters in-cate similar or equivalent parts.

Figure 1 is a side view of one form of the proved bottle; Fig. 2, a partial vertical ction through the central axis of another m thereof; Fig. 3, a vertical section ugh Fig. 1, and Fig. 4 a section on the A B of Fig. 3.

e field or hunting flask shown in Figs. 2 comprises a substantially cylindrical glass receptacle *a*, somewhat constrict-the neck, and an outer glass receptacle hich is also somewhat constricted at the . These two receptacles are carefully d together at the neck, the entire inner ce having been coated with a mercury layer *c*. The air between the receptacles is then evacuated or exhausted through tubular projections *d* in the foot of the outer receptacle, which are then sealed. Around the neck of the bottle is arranged an annular cushion or protector *e*, and the foot or bottom of the bottle is inclosed in a cup-shaped cushion or protector *f*, of suitable elastic material—such as cotton, wool, asbestos, or the like—or of colophony, shellac, sealing-wax, or other suitable rigid material. The bottle is inclosed in a substantially cylindrical metal case *g*, to which are soldered four metal bows *h*, forming eyes. The under part of the case *g* is closed by a cup-shaped bottom *h'*, which is soldered or fixed in any other suitable manner to the case *g*. Through the bows *h* a strap *i* can be drawn to serve for carrying the bottle, as usual with field-flasks. Into the mouth of the bottle a cork or other stopper *k* can be inserted, and a removable inverted cup *l* can be pushed over the neck. This cup can be held in place in any suitable manner.

In the form of construction shown in Fig. 3 disks or plates *m m'*, of asbestos board or other suitable heat-insulating material, are arranged between the receptacles *a* and *b*, so that the latter mutually support each other. Some of the said plates are horizontally arranged and others vertically. The vertical plates are supported by wire rings *n n'*, fixed to a number of vertical wires *o*, which support the horizontal plates *m* and *m'*. The upper ends of the wires *o* are bent over the curved part of the inner receptacle *a* at the neck of the bottle and are fixed to a wire ring *o'* (indicated by dotted lines in the drawings) and fastened around the neck of said inner receptacle.

We do not restrict our claims to the form of bottle consisting of two glass receptacles *a* and *b*, which is shown in the drawings, but also claim all other forms in which the bottle could be used as a field or hunting flask or the like. It must also be noted that the outer receptacle *b* can be inclosed in a casing of leather or other suitable material—as, for instance, of paper, papier-mâché, artificial leather, woven or knitted fabric, and the like. Finally, we desire to point out that the practical value of our invention consists in the fact that the liquid contained in the improved bottle remains for many

hours at the same temperature as that which it had when poured into the bottle. Thus, for instance, a workingman who fills his bottle in the morning with hot coffee or milk can keep the liquid till the evening, when it will still be hot. It will thus easily be understood that the bottle can with great advantage be used especially in the field or when hunting.

Having now particularly described and ascertained the nature of our said invention and in what manner the same is to be performed, we declare that what we claim is:

1. A flask, comprising separated receptacles connected at their necks and inclosing a vacuum-chamber between their bodies, heat-insulating members annularly disposed in the chamber, and means embracing the neck of the inner receptacle and holding the said members in position, substantially as described.

2. A flask, comprising separated receptacles connected at their necks and inclosing a vacuum-chamber between their bodies, horizontal and vertical insulating members annularly disposed in the chamber, and a wire structure suspended from the neck of the inner receptacle and holding the said members in position, substantially as described.

3. A flask, comprising an inner receptacle, and an outer receptacle connected thereto at the neck and presenting in conjunction with the first a vacuum-chamber and having two sealing-teats one at each side of the bottom, heat-insulating members annularly disposed in the chamber, and means for holding the said members in position, substantially as described.

4. A flask, comprising an inner receptacle, and an outer receptacle connected thereto at the neck and presenting in conjunction with the first a vacuum-chamber and having two sealing teats one at each side of the bottom, heat-insulating members annularly disposed in the chamber, means for holding the said members in position, a jacket inclosing the outer receptacle, a filling interposed between the outer receptacle and its jacket at the neck and for substantially as described.

5. In combination with a vacuum glass double walled vessel, a plurality of supports inserted between the walls of said vessels, and means for holding said supports against displacement.

6. In combination with a vacuum glass double walled vessel, a plurality of supports of elastic material interposed between the walls of said vessels, and means for holding said supports against displacement.

7. In combination with a vacuum glass double walled vessel, a plurality of supports of heat insulating material interposed between the walls of said vessels, and means for holding said supports against displacement.

8. In combination with a vacuum glass double walled vessel having a constricted neck and a cylindrical portion, a plurality of supports interposed between the walls of said body portion at a distance from the neck.

9. In combination with a vacuum glass double walled vessel, a plurality of supports interposed between the walls of said vessel and mutually connected together.

10. In combination with a vacuum glass double walled vessel, a plurality of supports interposed between the walls of said vessel and a ring connecting said supports.

11. In combination with a vacuum glass double walled vessel, a casing of metal covering the said vessel and having a flange extending over the circumferential edge of the mouth thereof.

12. In combination with a vacuum glass double walled vessel having a constricted neck, a casing of less frangible material covering the outer surface of said vessel having a constricted neck completely inclosing said vessel neck, and an annular band of elastic material disposed in and filling the space between said necks.

13. In combination with a vacuum glass double walled vessel having a constricted neck, a casing of less frangible material covering the outer surface of said vessel, and means wholly inclosing the neck of said vessel for supporting the same within said casing.

14. In combination with a vacuum glass double walled vessel having a constricted neck, a casing of less frangible material covering the outer surface of said vessel, means wholly inclosing the neck of said vessel for supporting the same within said casing, and means interposed between the walls of said vessel for preventing lateral vibrations of the inner wall.

15. In combination with a vacuum glass double walled vessel having a sealing teat, a casing covering the outer surface of said vessel, and a body of elastic material interposed between the said vessel and said casing and embedding said sealing teat.

In testimony whereof we affix our signatures in presence of two witnesses.

REINHOLD BURGER.
ALBERT ASCHENBRENNER.

Witnesses:
WOLDEMAR HAUPT,
HENRY HASPER.

5803

2063

382

R. BURGER & A. ASCHENBRENNER.

FIELD OR HUNTING FLASK.

APPLICATION FILED MAR. 15, 1909.

Reissued Mar. 15, 1910.

13,093.

Fig. 2.

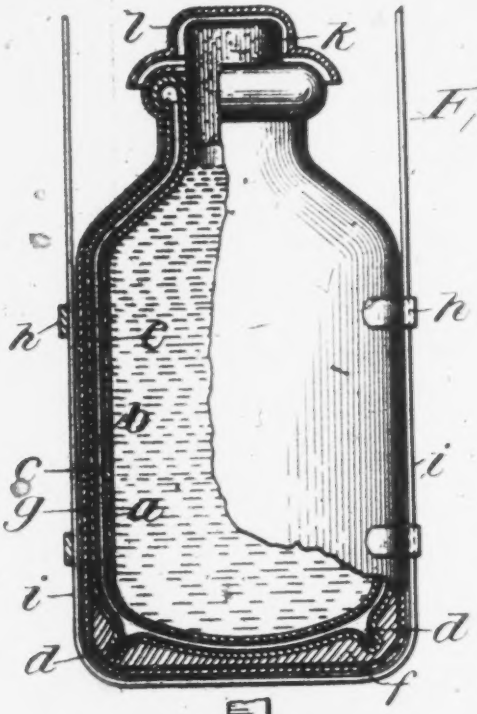


Fig. 4.

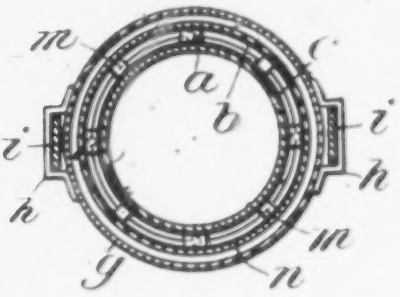


Fig. 3.

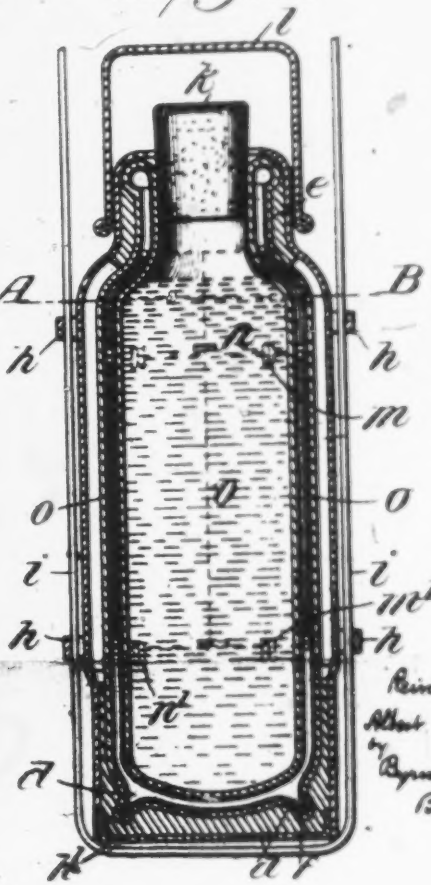
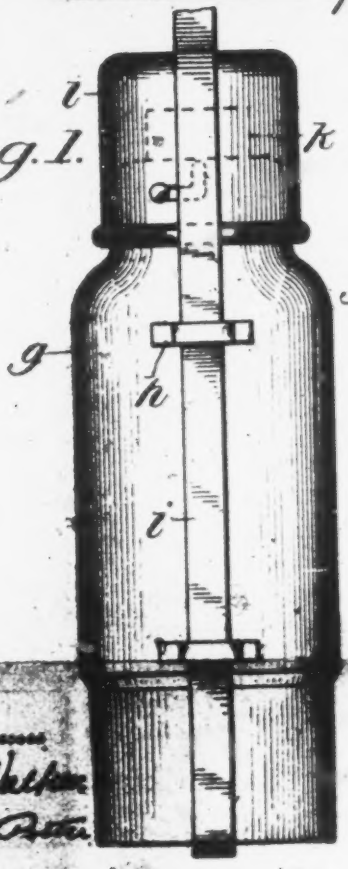


Fig. 1.



Witnesses:
C. M. Wheeler
E. L. Potter

Inventors:
Reinhold Burger,
Albert Aschenbrenner,
by Byrnes, Townsend & Brickenridge
Attys.

UNITED STATES PATENT OFFICE.

INHOLD BURGER AND ALBERT ASCHENBRENNER, OF BERLIN, GERMANY, ASSIGN-ORS TO AMERICAN THERMOS BOTTLE COMPANY, OF NEW YORK, N. Y., A CORPORATION OF MAINE.

FIELD OR HUNTING FLASK.

,093. Specification of Reissued Letters Patent. Reissued Mar. 15, 1910.

inal No. 820,347, dated May 8, 1906, Serial No. 223,254. Application for reissue filed March 15, 1909. Serial No. 483,658.

all whom it may concern:

Be it known that we, REINHOLD BURGER and ALBERT ASCHENBRENNER, subjects of the g of Prussia, German Emperor, residing Berlin, Germany, have invented certain and useful Improvements in Field or nting Flasks, (for which we have ob-ned a patent in Great Britain, numbered 21, A. D. 1904, and in France, numbered ,027;) and we do hereby declare that the owing is a full, clear, and exact descrip-n of the same.

This invention relates to field or hunting ks for the conveyance and storing of ids, more particularly of beverages. els of a similar kind are already known have been used for other purposes; but y have not the characteristic shape of improved bottle and are not provided h a protective jacket.

Another feature of our invention consists the fact that a layer of heat-insulating terial is arranged in peculiar manner be-en the two glass walls in order to pre-t the breaking of the glass by concussions the like at that part where the inner wall the bottle is connected with the outer l—that is to say, at the neck of the tle. Special novel means for this purpose be described hereinafter.

Another feature of the invention consists the fact that the tubes for evacuating the tle are not arranged at the center of the tom, but at the side thereof, so that it be more effectually protected from in-y and that the bottle and its jacket can be en a more suitable shape.

The invention is illustrated in the an-ed drawings, in which similar letters in-ate similar or equivalent parts.

Figure 1 is a side view of one form of the roved bottle; Fig. 2, a partial vertical ion through the central axis of another m thereof; Fig. 3, a vertical section ough Fig. 1, and Fig. 4 a section on the A B of Fig. 3.

The field or hunting flask shown in Figs. d 2 comprises a substantially cylindrical r glass receptacle *a*, somewhat constrict-t the neck, and an outer glass receptacle hich is also somewhat constricted at the k. These two receptacles are carefully d together at the neck, the entire inner been coated with a mercury layer *c*. The air between the receptacles is then evacuated or exhausted through tubular projections *d* in the foot of the outer receptacle, which are then sealed. Around the neck of the bottle is arranged an annular cushion or protector *e*, and the foot or bottom of the bottle is inclosed in a cup-shaped cushion or protector *f*, of suitable elastic material—such as cotton, wool, asbestos, or the like—or of colophony, shellac, sealing-wax, or other suitable rigid material. The bottle is inclosed in a substantially cylindrical metal case *g*, to which are soldered four metal bows *h*, forming eyes. The under part of the case *g* is closed by a cup-shaped bottom *h'*, which is soldered or fixed in any other suitable manner to the case *g*. Through the bows *h* a strap *i* can be drawn to serve for carrying the bottle, as usual with field-flasks. Into the mouth of the bottle a cork or other stopper *k* can be inserted, and a removable inverted cup *l* can be pushed over the neck. This cup can be held in place in any suitable manner.

In the form of construction shown in Fig. 3 disks or plates *m m'*, of asbestos board or other suitable heat-insulating material, are arranged between the receptacles *a* and *b*, so that the latter mutually support each other. Some of the said plates are horizontally arranged and others vertically. The vertical plates are supported by wire rings *n n'*, fixed to a number of vertical wires *o*, which support the horizontal plates *m* and *m'*. The upper ends of the wires *o* are bent over the curved part of the inner receptacle *a* at the neck of the bottle and are fixed to a wire ring *o'* (indicated by dotted lines in the drawings) and fastened around the neck of said inner receptacle.

We do not restrict our claims to the form of bottle consisting of two glass receptacles *a* and *b*, which is shown in the drawings, but also claim all other forms in which the bottle could be used as a field or hunting flask or the like. It must also be noted that the outer receptacle *b* can be inclosed in a casing of leather or other suitable material—as, for instance, of paper, papier-mâché, artificial leather, woven or knitted fabric, and the like. Finally, we desire to point out that the practical value of our invention consists in the fact that the liquid contained in the improved bottle remains for many

hours at the same temperature as that which it had when poured into the bottle. Thus, for instance, a workingman who fills his bottle in the morning with hot coffee or milk can keep the liquid till the evening, when it will still be hot. It will thus easily be understood that the bottle can with great advantage be used especially in the field or when hunting.

Having now particularly described and ascertained the nature of our said invention and in what manner the same is to be performed, we declare that what we claim is:

1. A flask, comprising separated receptacles connected at their necks and inclosing a vacuum-chamber between their bodies, heat-insulating members annularly disposed in the chamber, and means embracing the neck of the inner receptacle and holding the said members in position, substantially as described.

2. A flask, comprising separated receptacles connected at their necks and inclosing a vacuum-chamber between their bodies, horizontal and vertical insulating members annularly disposed in the chamber, and a wire structure suspended from the neck of the inner receptacle and holding the said members in position, substantially as described.

3. A flask, comprising an inner receptacle, and an outer receptacle connected thereto at the neck and presenting in conjunction with the first a vacuum-chamber and having two sealing-teats one at each side of the bottom, heat-insulating members annularly disposed in the chamber, and means for holding the said members in position, substantially as described.

4. A flask, comprising an inner receptacle, and an outer receptacle connected thereto at the neck and presenting in conjunction with the first a vacuum-chamber and having two sealing teats one at each side of the bottom, heat-insulating members annularly disposed in the chamber, means for holding the said members in position, a jacket inclosing the outer receptacle, and a filling interposed between the outer receptacle and its jacket at the neck and foot, substantially as described.

5. In combination with a vacuum glass double walled vessel, a plurality of supports inserted between the walls of said vessels, and means for holding said supports against displacement.

6. In combination with a vacuum glass double walled vessel, a plurality of supports of elastic material interposed between the walls of said vessels, and means for holding said supports against displacement.

7. In combination with a vacuum glass double walled vessel, a plurality of supports of heat insulating material interposed between the walls of said vessels, and means for holding said supports against displacement.

8. In combination with a vacuum double walled vessel having a constricted neck and a cylindrical portion, a plurality of supports interposed between the walls of said body portion at a distance from the neck.

9. In combination with a vacuum double walled vessel, a plurality of supports interposed between the walls of said vessel and mutually connected together.

10. In combination with a vacuum double walled vessel, a plurality of supports interposed between the walls of said vessel and a ring connecting said supports.

11. In combination with a vacuum double walled vessel, a casing of metal covering the said vessel and having a flange extending over the circumferential edge of the mouth thereof.

12. In combination with a vacuum double walled vessel having a constricted neck, a casing of less frangible material covering the outer surface of said vessel having a constricted neck completely inclosing said vessel neck, and an annular body of elastic material disposed in and filling the space between said necks.

13. In combination with a vacuum double walled vessel having a constricted neck, a casing of less frangible material covering the outer surface of said vessel, means wholly inclosing the neck of said vessel for supporting the same within said casing.

14. In combination with a vacuum double walled vessel having a constricted neck, a casing of less frangible material covering the outer surface of said vessel, means wholly inclosing the neck of said vessel supporting the same within said casing, means interposed between the walls of the vessel for preventing lateral vibration of the inner wall.

15. In combination with a vacuum double walled vessel having a sealing-teat, a casing covering the outer surface of the vessel, and a body of elastic material interposed between the said vessel and said casing and embedding said sealing teat.

In testimony whereof we affix our signatures in presence of two witnesses.

REINHOLD BURGER.
ALBERT ASCHENBRENNER.

Witnesses:
WOLDEMAR HAUPT,
HENRY HASPER.

386

L. B. STEEL.

HEAT INSULATING TUBE OR RECEPTACLE.

APPLICATION FILED OCT. 18, 1910.

1,002,009. Patented Aug. 29, 1911.

Fig. 1.

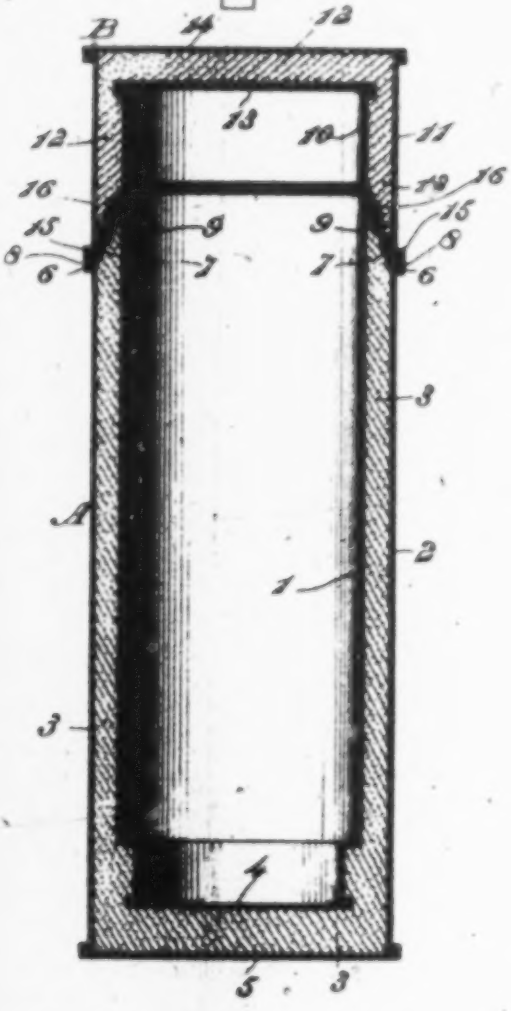
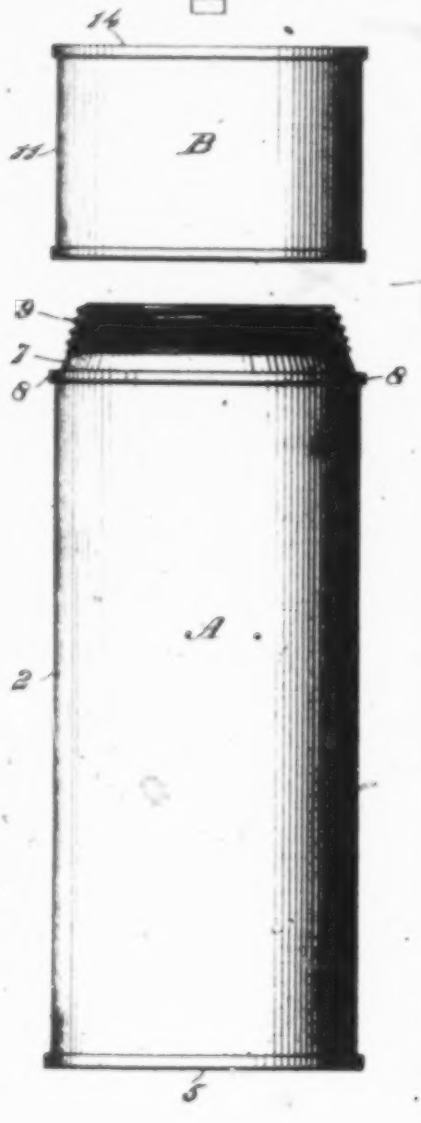


Fig. 2.



Witnesses
Harry King
Bradbury.

Inventor
Leonard R. Steel.
By Victor J. Evans
Attorney

UNITED STATES PATENT OFFICE.

LEONARD R. STEEL, OF CLEVELAND, OHIO.

HEAT-INSULATING TUBE OR RECEPTACLE.

002,009. Specification of Letters Patent. Patented Aug. 29, 1911.

Application filed October 12, 1910. Serial No. 586,744.

all whom it may concern:

Be it known that I, LEONARD R. STEEL, a izen of the United States, residing at eveland, in the county of Cuyahoga and ate of Ohio, have invented new and use- l Improvements in Heat-Insulating Tubes Receptacles, of which the following is a ecification.

This invention relates to inclosures for ttles containing liquid or the like that is be maintained for an indefinite period at e same temperature as that at which it s placed in the bottle.

The invention has for one of its objects improve and simplify the construction of eptacles or inclosures of the character ferred to so as to be comparatively simple d inexpensive to manufacture and of such sign as to effectively insulate the contents the inclosed bottle or container from the rrounding atmosphere.

With such and other objects in view, as ll appear as the description proceeds, the vention comprises the various novel fea- es of construction and arrangement of rts which will be more fully described reinafter and set forth with particularity the claim appended hereto.

In the accompanying drawing, which strates one embodiment of the invention, gure 1 is a vertical central section of the eptacle. Fig. 2 is a side view thereof h the cover raised from the body of the eptacle.

Similar reference characters are employed designate corresponding parts throughout views.

Referring to the drawing, A designates body of the insulating tube or receptacle, B, the cover or closure therefor, the re- tacle or tube being shown empty, but it o be understood that a glass bottle or er container shaped to fit the body A is pted to be used in connection with the e or receptacle.

The body A consists of inner and outer ndrical shells 1 and 2 that are of differ- diameters so as to provide an interven- chamber which is filled with cork, as- os or other material 3 that is a non-con- or of heat, and the bottom 4 of the in- shell is spaced above the bottom 5 of uter shell so that the intervening space with the insulating mate- which not only reinforces the outer shell but forms means whereby the inner shell can be joined thereto. The upper end of the inner shell 1 projects out of the outer shell and has a downwardly bent truncated portion or flange 7 and the widest part of this truncated portion is of substantially the same diameter as the outer shell. The bottom edge of the truncated portion 7 is curled outwardly around and under the flange 6 on the outer shell in the form of a bead 8 so as to form a joint between the inner and outer shell and also stiffen the upper end of the body A. The conical surface formed by the flange or truncated portion 7 is provided with screw threads 9 so as to secure the cover or closure B to the body A.

The cover or closure B consists of inner and outer shells 10 and 11 which are also of different diameters so as to provide an intervening chamber that is filled with non-conducting material 12 that extends also between the tops or heads 13 and 14 of the shells. The bottom portion of the inner shell 10 flares downwardly so as to be of the same diameter as the outer shell, and the bottom edge 15 of this flared portion is curled outwardly and upwardly around the bottom edge of the outer shell and can be soldered thereto to form a strong joint. The flared or conical portion of the inner shell is shaped to snugly fit the tapered upper end of the body A, and it is also provided with threads 16 for engaging the threads 9.

From the foregoing description, taken in connection with the accompanying drawing, the advantages of the construction and of the method of operation will be readily apparent to those skilled in the art to which the invention appertains, and while I have described the principle of operation of the invention, together with the device which I now consider to be the best embodiment thereof, I desire to have it understood that the device shown is merely illustrative, and that such changes may be made [illegible] sired as are within the scope of the claim appended hereto.

Having thus described the invention, what I claim as new, is:—

A tube or receptacle body consisting of inner and outer shells of different diameters insulating material filling [illegible]

...ATED STATES PATENT OFFICE.

LEONARD R. STEEL, OF CLEVELAND, OHIO.

HEAT-INSULATING TUBE OR RECEPTACLE.

1,002,009. Specification of Letters Patent. Patented Aug. 29, 1911.

Application filed October 12, 1910. Serial No. 586,744.

...all whom it may concern.

Be it known that I, LEONARD R. STEEL, a ...izen of the United States, residing at ...eveland, in the county of Cuyahoga and ...ate of Ohio, have invented new and use...l Improvements in Heat-Insulating Tubes ...Receptacles, of which the following is a ...ecification.

This invention relates to inclosures for ...ttles containing liquid or the like that is ...be maintained for an indefinite period at ...e same temperature as that at which it ...s placed in the bottle.

The invention has for one of its objects ...improve and simplify the construction of ...eptacles or inclosures of the character ...ferred to so as to be comparatively simple ...d inexpensive to manufacture and of such ...sign as to effectively insulate the contents ...the inclosed bottle or container from the ...rounding atmosphere.

With such and other objects in view, as ...l appear as the description proceeds, the ...vention comprises the various novel fea...es of construction and arrangement of ...rts which will be more fully described ...einafter and set forth with particularity ...the claim appended hereto.

...n the accompanying drawing, which ...strates one embodiment of the invention, ...gure 1 is a vertical central section of the ...eptacle. Fig. 2 is a side view thereof ...h the cover raised from the body of the ...eptacle.

...similar reference characters are employed ...designate corresponding parts throughout ...views.

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...he body A consists of inner and outer ...ndrical shells 1 and 2 that are of differ... diameters so as to provide an interven... chamber which is filled with cork, as...os or other material 3 that is a non-con...or of heat, and the bottom 4 of the in...shell is spaced above the bottom 5 of ...uter shell so that the intervening space ...lso be filled with the insulating mate...3. The upper edge of the shell 2 is ...d with an outstanding annular flange 6 which not only reinforces the outer shell but forms means whereby the inner shell can be joined thereto. The upper end of the inner shell 1 projects out of the outer shell and has a downwardly bent truncated portion or flange 7 and the widest part of this truncated portion is of substantially the same diameter as the outer shell. The bottom edge of the truncated portion 7 is curled outwardly around and under the flange 6 on the outer shell in the form of a bead 8 so as to form a joint between the inner and outer shell and also stiffen the upper end of the body A. The conical surface formed by the flange or truncated portion 7 is provided with screw threads 9 so as to secure the cover or closure B to the body A.

The cover or closure B consists of inner and outer shells 10 and 11 which are also of different diameters so as to provide an intervening chamber that is filled with non-conducting material 12 that extends also between the tops or heads 13 and 14 of the shells. The bottom portion of the inner shell 10 flares downwardly so as to be of the same diameter as the outer shell, and the bottom edge 15 of this flared portion is curled outwardly and upwardly around the bottom edge of the outer shell and can be soldered thereto to form a strong joint. The flared or conical portion of the inner shell is shaped to snugly fit the tapered upper end of the body A, and it is also provided with threads 16 for engaging the threads 9.

From the foregoing description, taken in connection with the accompanying drawing, the advantages of the construction and of the method of operation will be readily apparent to those skilled in the art to which the invention appertains, and while I have described the principle of operation of the invention, together with the device which I now consider to be the best embodiment thereof, I desire to have it understood that the device shown is merely illustrative, and that such changes may be made when desired as are within the scope of the claim appended hereto.

Having thus described the invention, what I claim as new, is:—

A tube or receptacle body consisting of inner and outer shells of different diameters, insulating material filling the space between the shells, an annular flange at the upper edge of the outer shell, the upper end of

the inner shell being turned downwardly to form a truncated flange, an annular bead at the lower edge of the truncated flange arranged in clamping engagement with the flange at the upper end of the outer shell, and a closure consisting of inner and outer shells of different diameters, insulating material between the shells, the inner shell being extended downwardly at an angle toward the lower extremity of the outer shell and contacting with the truncated flange on the said first named inner shell, the outer shell of the closure being formed at its lower end with a peripheral flange, and the said downwardly extending portion of the inner shell of the closure being formed with a peripheral bead which is arranged in clamping engagement with the flange of the said outer shell of the closure and which frictionally binds against the first named bead when the closure is in a closed position.

In testimony whereof I affix my signature in presence of two witnesses.

LEONARD R. STEEL.

Witnesses:
JOHN D. LLOYD,
MABEL LAWRENCE.

390

L. R. STEEL.

VACUUM INSULATED METAL MILK CAN.

APPLICATION FILED JULY 30, 1910.

1,067,072.

Patented July 8, 1913.

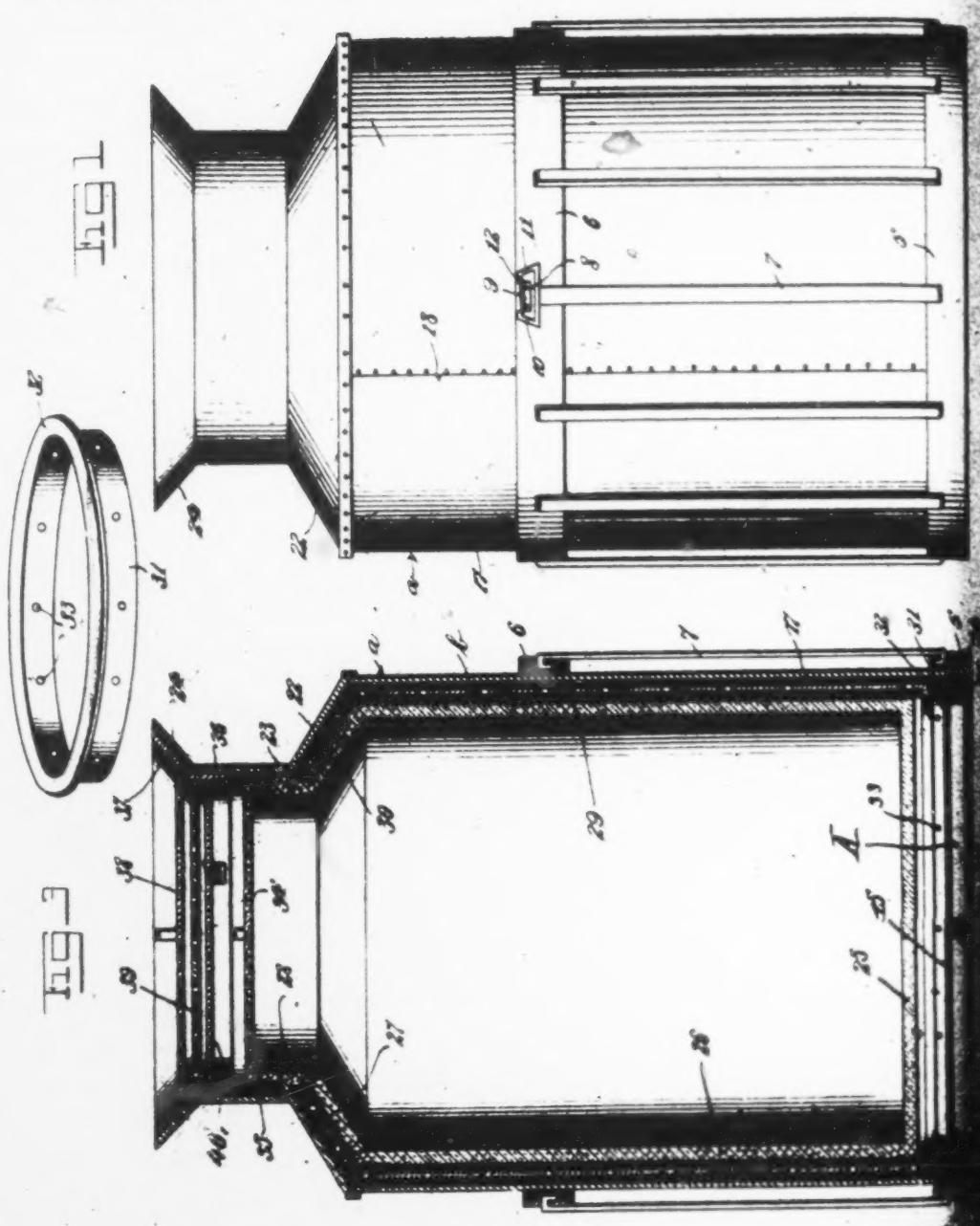


Fig 1

Fig 3

Fig 2

Witnesses

Inventor

Leonard R. Steel

By Victor J. Evans

Attorney

UNITED STATES PATENT OFFICE.

LEONARD R. STEEL, OF CLEVELAND, OHIO.

VACUUM-INSULATED METAL MILK-CAN.

,067,072. Specification of Letters Patent. Patented July 8, 1913.

Application filed July 20, 1910. Serial No. 573,900.

o all whom it may concern:

Be it known that I, LEONARD R. STEEL, a tizen of the United States, residing at leveland, in the county of Cuyahoga and tate of Ohio, have invented new and useful nprovements in Vacuum-Insulated Metal ilk-Cans, of which the following is a speci-ation.

This invention relates to improvements in ilk cans and more particularly to the type anted me by Letters Patent No. 947,864 Feb. 1, 1910. The object of the above re-rred to patent was to produce a milk can pable of being kept in a highly sanitary ndition at all times. Without departing om this object I seek to improve the milk n above stated by a construction having r its primary object the provision of a re-ptacle in which the milk may be kept at a edetermined temperature without the em-oyment of a refrigerating or heating me-um.

With these and other objects in view, hich will more fully hereinafter appear, e present invention consists in certain vel details of construction and arrange-nt of parts, hereinafter fully described, ustrated in the accompanying drawings, d more particularly pointed out in the ap-nded claim; it being understood that rious changes in the form, proportion, e, and minor details of the device may made, within the scope of the appended im, without departing from the spirit sacrificing any of the advantages of the vention.

In the accompanying drawings, forming rt of the specification:—Figure 1 is a side vation of the device. Fig. 2 is a longi-linal sectional view of the same. Fig. 3 detail perspective of the lower ring.

Similar numerals of reference are em-yed to designate corresponding parts oughout.

As shown in Fig. 1 the can is arranged hin a crate, the said crate being similar he crate shown in my former patent, be-referred to, with the exception that the dles of said crate in the present instance movable. As shown in Fig. 1 the crate udes a lower annular member 5 and an er annular member 6 connected and held relation by means of slats 7. The d at their upper ends to their opposite downwardly from the

ber 5 in the manner shown in Fig. 2. Positioned at diametrically opposite points on the upper circular member 6 and secured thereto by rivets 8 are a pair of plates, one of which is shown and designated by the numeral 9. The medial portions of the plates 9 are bulged outwardly and horizontally, the said bulged portions receiving the handles. The handles are each preferably formed of a single piece of stout steel wire or its equivalent bent into substantially a U-shape the opposite limbs of which are designated by the numerals 10 and 11. The limbs 10 and 11 have their free end portions bent in opposed directions as shown at 12 and inserted into the opposite ends of the bulged portion 9. With this construction it will be seen that the handles are free to swing in a vertical plane when the crate is in an upright position. The can forming part of the subject matter of the present invention is shown to include an outer receptacle *a* and an inner receptacle *b*. The outer receptacle includes a hollow bottom. This bottom comprises two telescoping disk-shaped sections of circular contour, the body portion of the lower of said sections being designated by the numeral 13 and peripherally provided with an upwardly extending circular flange 14. The body portion of the upper section is designated by the numeral 15 and is peripherally provided with a depending flange 16. The upper section is considerably less in diameter than the lower section, and since the widths of the flanges are approximately equal it will be evident when the flange 16 bears on the inner face of the body portion 13 that a space will exist between the body portions 13 and 15. The body of the outer receptacle is designated by the numeral 17 and is preferably formed of a single piece of sheet metal rolled into the shape of a hollow cylinder, the meeting ends of which overlap and are riveted or otherwise secured as shown at 18. The lower end portion of the body 17 is arranged between the opposed faces of the flanges 14 and 16 of the bottom, the parts being secured by means of rings 19 and 20. The ring 19 is arranged on the inner surface of the flange 16 depending from the body portion 15 of the upper section of the bottom, while the ring 20 is arranged on the outer surface of the flange extending

LEONARD R. STEEL, OF CLEVELAND, OHIO.

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end portions of the body are provided with alining openings for the reception of suitable well known fastening devices 21, the parts being further secured and hermetically sealed by means of solder. The upper end of the body portion 17 is provided with a dome-shaped head 22, the said dome-shaped head 22 having a central opening surrounded by an interiorly threaded neck 23. At the upper end of the neck 23 is a flared mouth 24, the function of which will appear later.

The inner section is preferably of glass, china, or any other analogous substance and includes a circular bottom 25, from the periphery of which rises a circular side wall 26. The side wall 26 has a dome-shaped head 27 which terminates in a shouldered neck 28. The shouldered neck 28 is exteriorly screw-threaded, the lower and larger portion of said neck screwing into the interiorly threaded neck of the outer casing, and the upper or smaller portion of the said shouldered neck extending into the neck 23 off the outer section. It will be understood that cement or any well known means may be interposed between the threaded portions above described so as to form therebetween a perfect air tight joint. By reference now to the drawings it will be seen that a considerable space exists between the wall 26 of the inner receptacle and the body portion 17 of the outer receptacle, and it will be manifest that when the neck of the inner receptacle is screwed into the neck of the outer receptacle that a space will surround the inner receptacle. Arranged in this space is a non-heat-conducting substance preferably a thin sheet of cork, asbestos, or their equivalents. This non-heat-conducting substance or insulation comprises a body portion 29, and an upper dome-shaped end portion 30. The body portion 29 of the insulation is supported by a base member, this base member comprising an annulus 31 peripherally provided with an outwardly extending flange 32 upon which bears the lower end of the body portion 29 of the insulation. The annulus is provided with a plurality of spaced openings 33. By reference now to Fig. 2 it will be seen that extending through the body portions 13 and 15 of the bottom sections is a tube 34 which is interiorly screw threaded for the reception of a plug 35, the inner end of the tube [illegible] surrounded by the annulus 31.

By constructing the can with the space between the body portion 17 of the can and the inner glass receptacle and arranging in the space the material 29, a partial vacuum [illegible] created in the space by extracting a

can and the inner glass receptacle a[illegible] to effectively protect the inner gla[illegible] tacle should the walls 17 becom[illegible] dentally punctured or otherwise pa[illegible] tilated in transit or destroyed to th[illegible] where the partial vacuum is destroy[illegible]

The cover for the inner recep[illegible] shown to comprise a circular body [illegible] designated by the numeral 34′, de[illegible] from the periphery of the said body [illegible] 34′ is a circular lip 35, the said l[illegible] interiorly screw-threaded to eng[illegible] the threads at the upper end portio[illegible] shouldered neck 28. The cover for th[illegible] receptacle comprises a cylindrical bo[illegible] tion 36, of a size to snugly fit wi[illegible] neck 23, the said body portion 36 be[illegible] vided with a flared side wall 37, of [illegible] to snugly fit within the flared mo[illegible] Arranged between the outer and inne[illegible] of the flared portion of the cover i[illegible] spaced relation to the body 36 is a pl[illegible] said plate 38 coöperating with the bod[illegible] tion 36 and the bottom plate 40 to [illegible] vide a compartment in which is ar[illegible] a non-heat-conducting disk 39. Wit[illegible] construction it will be manifest that [illegible] the air is exhausted in the compartm[illegible] heat of the atmosphere will be pr[illegible] from effecting the milk in the inner [illegible] tacle.

The non-heat conducting substanc[illegible] spaced throughout from the walls [illegible] outer receptacle *a* and the inner rec[illegible] *b* so that it will not interfere with th[illegible] ing of a vacuum or rarefied space b[illegible] the walls of the inner and outer rec[illegible] being perforated so as to permit th[illegible] be readily and thoroughly exhaust[illegible] the space when desired. By provi[illegible] thin strip of non-heat conducting [illegible] it forms a protecting element surr[illegible] the inner receptacle *b* so as to pr[illegible] receptacle in the event of the out[illegible] tacle becoming accidentally punc[illegible] mutilated to the extent that the [illegible] would be destroyed. By provi[illegible] outer receptacle with the spaced b[illegible] upper walls 13 and 15 they form [illegible] entirety an intervening rarefied o[illegible] space A immediately beneath the [illegible] ceptacle. Should the lower bot[illegible] ber 13 become punctured, it is o[illegible] the purpose of the space A as an [illegible] beneath the bottom of the inner [illegible] will be destroyed, but the botto[illegible] member 15, should it remain int[illegible] tial accidental destruction to [illegible] member 13 would prevent dest[illegible] vacuum in the space between the [illegible] and outer receptacles.

I claim:—

[illegible] comprising an outer [illegible]

end portions of the body are provided with alining openings for the reception of suitable well known fastening devices 21, the parts being further secured and hermetically sealed by means of solder. The upper end of the body portion 17 is provided with a dome-shaped head 22, the said dome-shaped head 22 having a central opening surrounded by an interiorly threaded neck 23. At the upper end of the neck 23 is a flared mouth 24, the function of which will appear later.

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By constructing the can with the space between the body portion 17 of the can and the inner glass receptacle and arranging in the space the material 29, a partial vacuum can be created in the space by extracting a great portion of the air therefrom by way of the tube 34. The material 29 forms an insulation between the outer walls of the can and the inner glass receptacle [illegible] to effectively protect the inner glass tacle should the walls 17 become dentally punctured or otherwise p tilated in transit or destroyed to t where the partial vacuum is destr

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I claim:—

A can comprising an outer rec vided with an upper neck, an i tacle having a neck extendin

of the outer receptacle and adjustably ected therewith and wholly supporting inner receptacle from the neck of the r receptacle, a double walled bottom ng the outer receptacle, an annulus sup- ted by the bottom and heat insulating erial interposed between the side walls the inner receptacle and the side walls the outer receptacle and terminally rest- on its lower edge on the annulus, the pension of the inner receptacle within outer receptacle spacing the bottom of the latter from the bottom of the former and the space between the bottoms of the two receptacles being in direct communication with the space between the sides of said receptacles.

In testimony whereof I affix my signature in presence of two witnesses.

LEONARD R. STEEL.

Witnesses:
MABEL LAWRENCE,
JOHN D. LLOYD.

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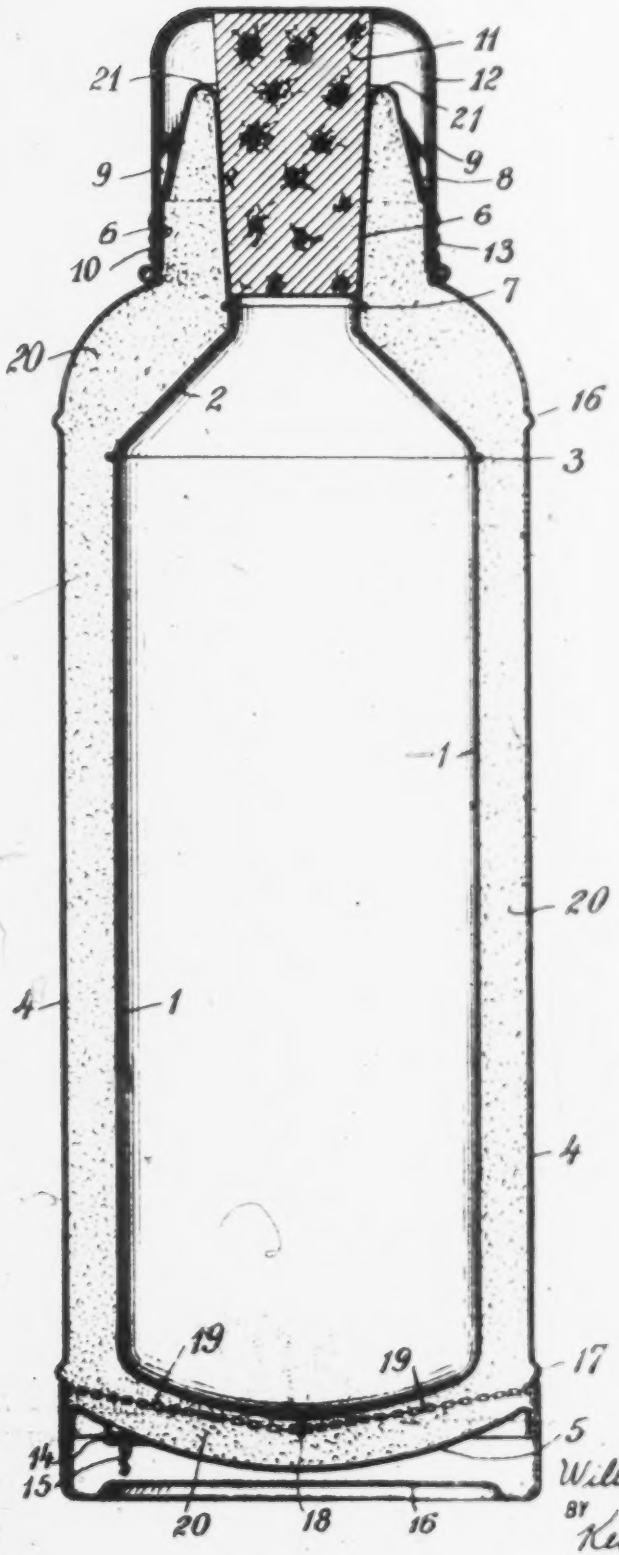
W. STANLEY.

HEAT INSULATED RECEPTACLE.

APPLICATION FILED AUG. 6, 1913.

1,071,817.

Patented Sept. 2, 1913.



WITNESSES

John O. Sampler

George Gilbert

INVENTOR

William Stanley

BY

Kenyon & Kenyon

ATTORNEYS

UNITED STATES PATENT OFFICE.

WILLIAM STANLEY, OF GREAT BARRINGTON, MASSACHUSETTS.

HEAT-INSULATED RECEPTACLE.

071,817. Specification of Letters Patent. Patented Sept. 2, 1913.

Application filed August 5, 1912. Serial No. 713,245.

all whom it may concern:

Be it known that I, WILLIAM STANLEY, a izen of the United States, and a resident Great Barrington, Berkshire county, ate of Massachusetts, have invented cer- in new and useful Improvements in Heat- sulated Receptacles, of which the follow- g is a specification.

My invention relates to heat insulating rriers and more particularly to the in- lation of receptacles having an inner shell rrounded by an outer shell with a vacu- s space therebetween and commonly own as vacuum bottles etc. My inven- on, however, may be applied to milk cans d many other devices and arrangements.

The common vacuum receptacle has its ells or walls constructed of glass and ac- rdingly such receptacles are very liable breakage and cannot withstand hard sage. Moreover, it is found that a very gh degree of exhaustion must be main- ined in the vacuous space in order to get fficient heat insulation to make the devices racticable for ordinary uses. Further- ore, because such receptacles are made of lass they are limited in size.

The main objects of my invention are to ercome one or more of these difficulties or isadvantages.

In order to produce bottles which are not able to breakage it has been suggested that e shells be constructed of metal instead of lass but such bottles have been found en- rely unsuccessful because the high de- ee of exhaustion required is not main- ined in the vacuous space, probably be- use under the greatly reduced pressure e metal gives off gas for a long time hich reduces the degree of exhaustion to ch an extent that the bottles have not eat enough insulating powers to render em usable for most purposes, so that they e entirely impracticable. In order to vercome these difficulties I fill the vacuous ace with a finely divided material which off any material amount of y change the gaseous pres- usted space. If the space a material the same degree may be obtained at a gaseous pressure (*i. e.*, on) in the vacuous space, less reduced pressure will tially constant even in a vessel constructed with metallic shells, probably because the metal does not give off a sufficient amount of gas to materially change the reduced gaseous pressure in the vacuous space. I preferably, however, use a finely divided substance which will not only not give off gas in the vacuous space, but will have in addition the power of absorbing any small amount of gas given off to the vacuous space by the metal shells.

I am aware that it has been suggested that the vacuous space of a receptacle of the class in question be filled with a finely divided substance, but in every such case, as far as I am aware, the material has been of a character to give off gas in the vacuous space so that in time the exhaustion and heat insulation powers became so reduced that the receptacles became practically inoperative and entirely unfit for the purposes for which they were intended. It is therefore important that the finely divided material be of a character such that it will not give off any material amount of gas in the vacuous space.

As stated above, a high degree of exhaustion is required to insulate the (glass) vacuum bottle of commerce. In my bottle a much lower vacuum is required, because it is only necessary to exhaust the spaces, voids, or cavities left in the filling material (which voids or cavities are of a microscopic order of magnitude) to a point at which the average distance between all the molecules of the residual gas is approximately equal to the diameter or distance across the voids, high thermal insulation being thus obtained when the order of magnitude of the pressure of the residual gas is one hundred times as great as the residual gaseous pressure in the common exhausted bottle of commerce. In other words, the introduction of properly chosen finely divided filling material may permit the exhaustion to be one hundred times less than is necessary if no such filling is used. A still greater exhaustion will increase to some extent the insulation, but it is rarely necessary. The degree of exhaustion necessary to produce a given insulation depends upon the fineness of division of the material. It will, however, be clear that the use of such a finely divided substance, which will not give off gas or one which will absorb gas in the vacuous space is of

WILLIAM STANLEY, OF GREAT BARRINGTON, MASSACHUSETTS.

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1,071,817. Specification of Letters Patent. Patented Sept. 2, 1913.

Application filed August 5, 1912. Serial No. 713,945.

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Be it known that I, WILLIAM STANLEY, a citizen of the United States, and a resident of Great Barrington, Berkshire county, State of Massachusetts, have invented certain new and useful Improvements in Heat-Insulated Receptacles, of which the following is a specification.

My invention relates to heat insulating barriers and more particularly to the insulation of receptacles having an inner shell surrounded by an outer shell with a vacuous space therebetween and commonly known as vacuum bottles etc. My invention, however, may be applied to milk cans and many other devices and arrangements.

The common vacuum receptacle has its shells or walls constructed of glass and accordingly such receptacles are very liable to breakage and cannot withstand hard usage. Moreover, it is found that a very high degree of exhaustion must be maintained in the vacuous space in order to get sufficient heat insulation to make the devices practicable for ordinary uses. Furthermore, because such receptacles are made of glass they are limited in size.

The main objects of my invention are to overcome one or more of these difficulties or disadvantages.

In order to produce bottles which are not liable to breakage it has been suggested that the shells be constructed of metal instead of glass but such bottles have been found entirely unsuccessful because the high degree of exhaustion required is not maintained in the vacuous space, probably because under the greatly reduced pressure the metal gives off gas for a long time which reduces the degree of exhaustion to such an extent that the bottles have not great enough insulating powers to render them usable for most purposes, so that they are entirely impracticable. In order to overcome these difficulties I fill the vacuous space with a finely divided material which will not give off any material amount of gas to materially change the gaseous pressure in the exhausted space. If the space be filled with such a material the same degree of heat insulation may be obtained at a much less reduced gaseous pressure (*i. e.*, much less exhaustion) in the vacuous space, and the said much less reduced pressure will be maintained substantially constant even in a vessel constructed with metallic shells, probably because the metal does not give off a sufficient amount of gas to materially change the reduced gaseous pressure in the vacuous space. I preferably, however, use a finely divided substance which will not only not give off gas in the vacuous space, but will have in addition the power of absorbing any small amount of gas given off to the vacuous space by the metal shells.

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special importance if the receptacle be constructed with metallic shells.

Further objects, features and advantages will more clearly appear from the detailed description given below taken in connection with the accompanying drawing which forms a part of this specification. The drawing shows a vertical section of a vacuum bottle embodying my improvements in one form.

Referring to the drawing, 1 represents an inner steel cylindrical shell provided with a top portion 2 welded thereto at 3. The body of the shell 1 is cylindrical in shape. Extending symmetrically about the inner shell is an outer metal cylindrical shell 4 having a bottom 5 secured thereto. The two shells are connected together entirely around the mouth of the receptacle by means of a steel neck 6 welded to the top 2 at 7, and secured to the outer shell 4 at 8, so as to form a space between the two shells which may be suitably exhausted. The inner surfaces of the shell 1 with its top 2 and neck 6 are covered with any suitable or well known vitreous or vitrified coating such as enamel, etc., or they may be tinned or covered with a protecting varnish or the like, in order that the inside of the vessel may be protected and easily kept clean and sanitary.

Extending about the neck of the bottle is a circular piece 9 having its lower portion threaded at 10. For closing the mouth of the bottle a stopper 11 of cork or other suitable material is inserted therein, and over this is placed a metallic cup-shaped cap 12 threaded at its lower portion 13 for engagement with the screw threads at 10. The bottom 5 is recessed at 14 and provided with a metal tube 15 through which the space between the shells may be exhausted (say to .01—m. m.), and after exhaustion the tube is crimped and soldered to effectively seal the vacuous space. A lower base or bottom 16 is secured to the outer shell 4 after exhaustion to complete the receptacle. The outside surfaces of the receptacle may be nickeled and beads 16 and 17 provided in the shell 4 to strengthen the receptacle. In order to more securely hold the lower end of the inner shell 1 in place with respect to the outer shell, I provide a spider connecting the two shells, which consists principally of a projection 18 secured to the bot-

tom of the inner shell and small links, wires [illegible] with [illegible] wires or chains [illegible] resistance that [illegible] power is negligible. [illegible] bottoms 5 and 16 [illegible] shells is filled with a [illegible] 20 chosen or pre-

which such receptacles are designed [illegible] used. For this purpose sublimed [illegible] forms a good substance and may be [illegible] with success. By filling the vacuous [illegible] with this material a very high degree of [illegible] insulation may be obtained with a much [illegible] reduction of gaseous pressure than [illegible] narily employed, as any small amount [illegible] gas given off by the metallic walls [illegible] these conditions will not materially [illegible] the gaseous pressure and corresponding [illegible] insulation.

Obviously other substances may be [illegible] to fill the vacuous space. Even materials which are ordinarily good heat conductors [illegible] if in sufficiently finely divided condition [illegible] may be used. Such substances as metallic oxids, finely divided metals, etc., may be used, the nature of the filling substance being quite immaterial provided it is sufficiently divided and will not give off gases (including vapors) after the exhaustion.

If desired, a finely divided substance may be used which will not only not give off gases to the vacuous space but will have an appetite for gas or the power of absorbing gases under the conditions of use. A suitable material for this purpose is finely divided carbon which has been highly heated to remove occluded gases and also heated in the vacuous space at the time of exhaustion to a temperature higher than the temperature at which the receptacle is to be generally used. The carbon so treated will thereafter absorb any small amounts of gas given off to the vacuous space by or from the metal shells and thus aid in keeping up the high exhaustion necessary for proper insulation. The carbon will so act even when hot materials are placed in the receptacle, although it is necessary to heat the carbon nearly to the temperature at which it was heated at the time of exhaustion before it will completely absorb gases from the vacuous space. Obviously various other gas absorbing materials may be employed with success.

Successful receptacles constructed of metallic shells may be produced by the use of such gas absorbing materials in the vacuous space even although the space is not exhausted with them. Since however in such case a high degree of exhaustion must be much greater in order to produce the same degree of insulation I prefer to practically fill the vacuous space with the finely divided substance. A certain amount of heat transmission through the sides and neck of a receptacle of the class described is usually unavoidable but by reducing the losses through the neck the same insulation value of the receptacle may be maintained with a higher gaseous pressure (less exhaustion) in the vacuous space whereby any small amount of gas given off to the

special importance if the receptacle be constructed with metallic shells.

Further objects, features and advantages will more clearly appear from the detailed description given below taken in connection with the accompanying drawing which forms a part of this specification. The drawing shows a vertical section of a vacuum bottle embodying my improvements in one form.

Referring to the drawing, 1 represents an inner steel cylindrical shell provided with a top portion 2 welded thereto at 3. The body of the shell 1 is cylindrical in shape. Extending symmetrically about the inner shell is an outer metal cylindrical shell 4 having a bottom 5 secured thereto. The two shells are connected together entirely around the mouth of the receptacle by means of a steel neck 6 welded to the top 2 at 7, and secured to the outer shell 4 at 8, so as to form a space between the two shells which may be suitably exhausted. The inner surfaces of the shell 1 with its top 2 and neck 6 are covered with any suitable or well known vitreous or vitrified coating such as enamel, etc., or they may be tinned or covered with a protecting varnish or the like, in order that the inside of the vessel may be protected and easily kept clean and sanitary.

Extending about the neck of the bottle is a circular piece 9 having its lower portion threaded at 10. For closing the mouth of the bottle a stopper 11 of cork or other suitable material is inserted therein, and over this is placed a metallic cup-shaped cap 12 threaded at its lower portion 13 for engagement with the screw threads at 10. The bottom 5 is recessed at 14 and provided with a metal tube 15 through which the space between the shells may be exhausted (say to .01—m. m.), and after exhaustion the tube is crimped and soldered to effectively seal the vacuous space. A lower base or bottom 16 is secured to the outer shell 4 after exhaustion to complete the receptacle. The outside surfaces of the receptacle may be nickeled and beads 16 and 17 provided in the shell 4 to strengthen the receptacle. In order to more securely hold the lower end of the inner shell 1 in place with respect to the outer shell, I provide a spider connecting the two shells, which consists principally of a projection 18 secured to the bottom of the inner shell and small links, wires or chains 19 connecting this projection with the outer shell 4. The links, wires or chains 19 are of so high thermal resistance that their heat conducting power is negligible.

Before putting on the bottoms 5 and 16 the space between the shells is filled with a finely powdered material 20 chosen or prepared so as not to give off any material amount of gas at ordinary temperatures at which such receptacles are desig… used. For this purpose sublimed … forms a good substance and may be … with success. By filling the vacuous … with this material a very high degree … insulation may be obtained with a m… reduction of gaseous pressure than … narily employed, as any small amou… gas given off by the metallic walls … these conditions will not materially … the gaseous pressure and corresponding … insulation.

Obviously other substances may be … to fill the vacuous space. Even mat… which are ordinarily good heat condu… if in sufficiently finely divided condi… may be used. Such substances as m… oxids, finely divided metals, etc., may … used, the nature of the filling substance … ing quite immaterial provided it is … ciently divided and will not give off … (including vapors) after the exhaustion …

If desired, a finely divided substance … be used which will not only not give off … to the vacuous space but will have an … tite for gas or the power of absorbing … under the conditions of use. A suitable … terial for this purpose is finely divided … bon which has been highly heated to … move occluded gases and also heated … vacuous space at the time of exhaustion … a temperature higher than the tempera… at which the receptacle is to be … used. The carbon so treated will there… absorb any small amounts of gas given … the vacuous space by or from the … shells and thus aid in keeping up the … haustion necessary for proper insulation … The carbon will so act even when … terials are placed in the receptacle, … is necessary to heat the carbon nearly … temperature at which it was heated … time of exhaustion before it will … absorb gases from the vacuous space. … viously various other gas absorbing … rials may be employed with success.

Successful receptacles constructed … tallic shells may be produced by the … such gas absorbing materials in the … space even although the space is not … with them. Since however in such … degree of exhaustion must be much … in order to produce the same degree … insulation I prefer to practically … vacuous space with the finely divided … stance. A certain amount of heat … sion through the sides and neck of a … cle of the class described is usually … sible but by reducing the losses thro… neck the same insulation value of … ceptacle may be maintained with a … gaseous pressure (less exhaustion) … vacuous space whereby any small amo… gas which may be given off to the … the metallic parts will not make …

great percentage of change in the gaseous pressure and the degree of insulation is more nearly maintained constant. In order to reduce the losses through the neck to bring about this result, I provide the receptacle with a long narrow neck 6 extending from the seam 7 to the top 21. The neck though of metal, yet being long and narrow has such a high thermal resistance that the losses therethrough are small. By increasing the amount of exhaustion however, the high resistance feature of the neck may be omitted.

Although I have described my invention with respect to certain particular embodiments thereof, nevertheless I do not desire to be limited to the particular details shown and described except as clearly specified in the appended claims, since many changes, modifications and substitutions may be made without departing from my invention in its broader aspects and my invention in its broader aspects may be found useful in many other applications thereof.

Having fully and clearly described my invention, what I claim as new and desire to secure by Letters Patent, is:

1. A heat insulating barrier comprising two metallic walls suitably connected and spaced apart, the space between said walls being filled with finely divided material which will absorb gas at ordinary temperatures and reduced pressures, the said space being exhausted to such a degree as to greatly reduce the conductivity for heat between the two metallic walls.

2. A heat insulated receptacle having an inner metallic shell with a vitreous coating on its inner surface and an outer metallic shell extending about the inner shell and spaced therefrom and connected to the inner shell at the mouth of the receptacle by a metallic neck of high thermal resistance, the space between said shells being filled with finely divided material substantially incapable of giving off gas but which will absorb gas at ordinary temperatures and reduced pressures, and the said space also being exhausted to such a degree as to greatly reduce the conductivity for heat between the two shells.

3. A heat insulating barrier comprising two walls suitably connected and spaced apart to form a vacuous space therebetween, said space containing finely divided material substantially incapable of giving off gas at ordinary temperatures and reduced pressures, and the said space being exhausted to such a degree as to greatly reduce the conductivity for heat between the two walls.

4. A heat insulated receptacle having an inner metallic shell and an outer metallic shell extending about the inner shell and spaced therefrom and connected to the inner shell at the mouth of the receptacle by a neck of high thermal resistance, and the space between said shells being filled with finely divided material substantially incapable of giving off gas at ordinary temperatures and reduced pressures, and the said space also being exhausted to such a degree as to greatly reduce the conductivity for heat between the two shells.

5. A heat insulated receptacle having an inner metallic shell and an outer metallic shell extending about the inner shell and spaced therefrom and connected to the inner shell at the mouth of the receptacle, the space between said shells being filled with finely divided material incapable of giving off gas at ordinary temperatures and reduced pressures, and the said space also being exhausted to such a degree as to greatly reduce the conductivity for heat between the two shells.

6. A heat insulated receptacle having an inner shell, and an outer shell extending about the inner shell and spaced therefrom and connected to the inner shell at the mouth of the receptacle, and the space between said shells being filled with finely divided material which will absorb gas at ordinary temperatures and at the reduced pressures of the space, the said space also being exhausted to such a degree as to greatly reduce the conductivity for heat between the two shells.

7. A heat insulated receptacle having an inner shell, and an outer metallic shell extending about the inner shell and spaced therefrom and connected to the inner shell at the mouth of the receptacle by a neck of high thermal resistance, and the space between said shells being filled with finely divided material which will absorb gas at ordinary temperatures and reduced pressures, and the said space also being exhausted to such a degree as to greatly reduce the conductivity for heat between the two shells.

8. A heat insulating barrier comprising two walls suitably connected and spaced apart to form a vacuous space therebetween, said space being filled with finely divided material substantially incapable of giving off gas at ordinary temperatures and reduced pressures, and the said space being exhausted to such a degree as to greatly reduce the conductivity for heat between the two walls.

9. A heat insulated receptacle having an inner metallic shell and an outer metallic shell extending about the inner shell and spaced therefrom and connected to the inner shell at the mouth thereof, the space between said shells being exhausted and filled with a finely divided material which has been heated in the space at the time of exhaustion to a

reat percentage of change in the gaseous ressure and the degree of insulation is ore nearly maintained constant. In order reduce the losses through the neck to ring about this result, I provide the recep- cle with a long narrow neck 6 extending om the seam 7 to the top 21. The neck ough of metal, yet being long and narrow s such a high thermal resistance that the sses therethrough are small. By increas- g the amount of exhaustion however, the gh resistance feature of the neck may be nitted.

Although I have described my invention th respect to certain particular embodi- nts thereof, nevertheless I do not desire be limited to the particular details shown d described except as clearly specified in e appended claims, since many changes, odifications and substitutions may be made thout departing from my invention in its oader aspects and my invention in its oader aspects may be found useful in ny other applications thereof.

Having fully and clearly described my in- ntion, what I claim as new and desire to cure by Letters Patent, is:

1. A heat insulating barrier comprising o metallic walls suitably connected and aced apart, the space between said walls ing filled with finely divided material ich will absorb gas at ordinary tempera- es and reduced pressures, the said space ing exhausted to such a degree as to eatly reduce the conductivity for heat be- een the two metallic walls.

2. A heat insulated receptacle having an er metallic shell with a vitreous coating its inner surface and an outer metallic ll extending about the inner shell and aced therefrom and connected to the inner ll at the mouth of the receptacle by a tallic neck of high thermal resistance, the ce between said shells being filled with ly divided material substantially inca- le of giving off gas but which will ab- gas at ordinary temperatures and re- ed pressures, and the said space also be- exhausted to such a degree as to greatly uce the conductivity for heat between two shells.

A heat insulating barrier comprising walls suitably connected and spaced rt to form a vacuous space therebetween, space containing finely divided material antially incapable of giving off gas at inary temperatures and reduced pres- , and the said space being exhausted to a degree as to greatly reduce the con- ity for heat between the two walls.

A heat insulated receptacle having an metallic shell and an outer metallic ll extending about the inner shell and ced therefrom and connected to the in- hell at the mouth of the receptacle by a metallic neck of high thermal resistance, and the space between said shells being filled with finely divided material substantially incapable of giving off gas at ordinary temperatures and reduced pressures, and the said space also being exhausted to such a degree as to greatly reduce the conductivity for heat between the two shells.

5. A heat insulated receptacle having an inner metallic shell and an outer metallic shell extending about the inner shell and spaced therefrom and connected to the inner shell at the mouth of the receptacle, the space between said shells being filled with finely divided material incapable of giving off gas at ordinary temperatures and reduced pressures, and the said space also being exhausted to such a degree as to greatly reduce the conductivity for heat between the two shells.

6. A heat insulated receptacle having an inner shell, and an outer shell extending about the inner shell and spaced therefrom and connected to the inner shell at the mouth of the receptacle, and the space between said shells being filled with finely divided material which will absorb gas at ordinary temperatures and at the reduced pressures of the space, the said space also being exhausted to such a degree as to greatly reduce the conductivity for heat between the two shells.

7. A heat insulated receptacle having an inner shell, and an outer metallic shell extending about the inner shell and spaced therefrom and connected to the inner shell at the mouth of the receptacle by a neck of high thermal resistance, and the space between said shells being filled with finely divided material which will absorb gas at ordinary temperatures and reduced pressures, and the said space also being exhausted to such a degree as to greatly reduce the conductivity for heat between the two shells.

8. A heat insulating barrier comprising two walls suitably connected and spaced apart to form a vacuous space therebetween, said space being filled with finely divided material substantially incapable of giving off gas at ordinary temperatures and reduced pressures, and the said space being exhausted to such a degree as to greatly reduce the conductivity for heat between the two walls.

9. A heat insulated receptacle having an inner metallic shell and an outer metallic shell extending about the inner shell and spaced therefrom and connected to the inner shell at the mouth thereof, the space between said shells being exhausted and filled with a finely divided material which has been heated in the space at the time of exhaustion to a temperature higher than the ordinary temperatures at which the receptacle is to be generally used; whereby

the material is adapted to absorb gas from the space at ordinary temperatures at which the receptacle is to be generally employed.

10. A heat insulated receptacle having an interior metallic shell and an exterior metallic shell extending about the inner shell and spaced therefrom and connected to the inner shell at the mouth of the receptacle by a neck of high thermal resistance, the space between said shells containing finely divided material which has been heated in the space at the time of exhaustion to a temperature higher than the ordinary temperatures at which the receptacle is to be generally used, whereby the material is adapted to absorb gas from the space at ordinary temperatures at which the receptacle is to be generally used, said space being exhausted to such a degree as to greatly reduce the conductivity for heat between the two shells.

11. A heat insulated receptacle having an interior metallic shell and an exterior metallic shell extending about the inner shell and spaced therefrom and connected to the inner shell at the mouth of the receptacle. the space between said shells containing finely divided material which has been heated to a temperature higher than the ordinary temperatures at which the receptacle is to be generally used, whereby the material is adapted to absorb gas from the space at ordinary temperatures at which the receptacle is to be generally used, said space being exhausted to such a degree as to greatly reduce the conductivity for heat between the two shells.

12. A heat insulated receptacle comprising metallic walls, suitably joined, embracing a vacuous space filled with finely divided material which will not give off gas to the space at ordinary temperatures, said space being exhausted to such a degree as to greatly reduce the conductivity for heat across said space.

13. A heat insulated receptacle comprising spaced metallic walls suitably joined to form a vacuous space, said space being filled with material leaving voids or cavities of a microscopic order of magnitude and the number of which is practically infinitely large, said material being of a character not to give off gas to the space between the walls and said space being exhausted of gas to such an extent as to separate the molecules of gas by an average distance at least as great as the average distance across said voids or cavities.

14. A heat insulated receptacle comprising spaced walls, suitably joined, to form a vacuous space therebetween, said space being filled with a finely divided substance which will not give off gas in the vacuous space at ordinary temperatures and which leaves voids or cavities of a microscopic order of magnitude and the number of which is practically infinitely large, said voids or cavities being exhausted of gas only to about such an extent as to separate the molecules of gas by an average distance greater than the average distance across said voids or cavities.

15. A heat insulating barrier comprising two walls suitably connected and spaced apart to form a vacuous space therebetween, said space containing finely divided material which will absorb gas at the ordinary temperatures and reduced pressures, the said space being exhausted to such a degree as to greatly reduce the conductivity for heat between the two walls.

In testimony whereof, I have signed my name to this specification, in the presence of two subscribing witnesses.

WILLIAM STANLEY.

Witnesses:
C. P. RANDOLPH,
F. G. LARAMEE.

402

ST. VRAIN LE SIEUR.

VACUUM MILK CAN.

APPLICATION FILED APR. 19, 1912. RENEWED DEC. 8, 1913.

1,119,968. Patented Dec. 8, 1914.

Fig. 2.

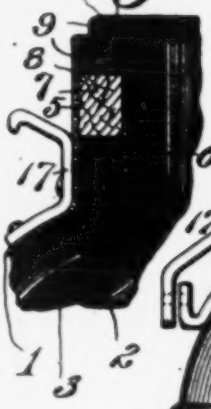
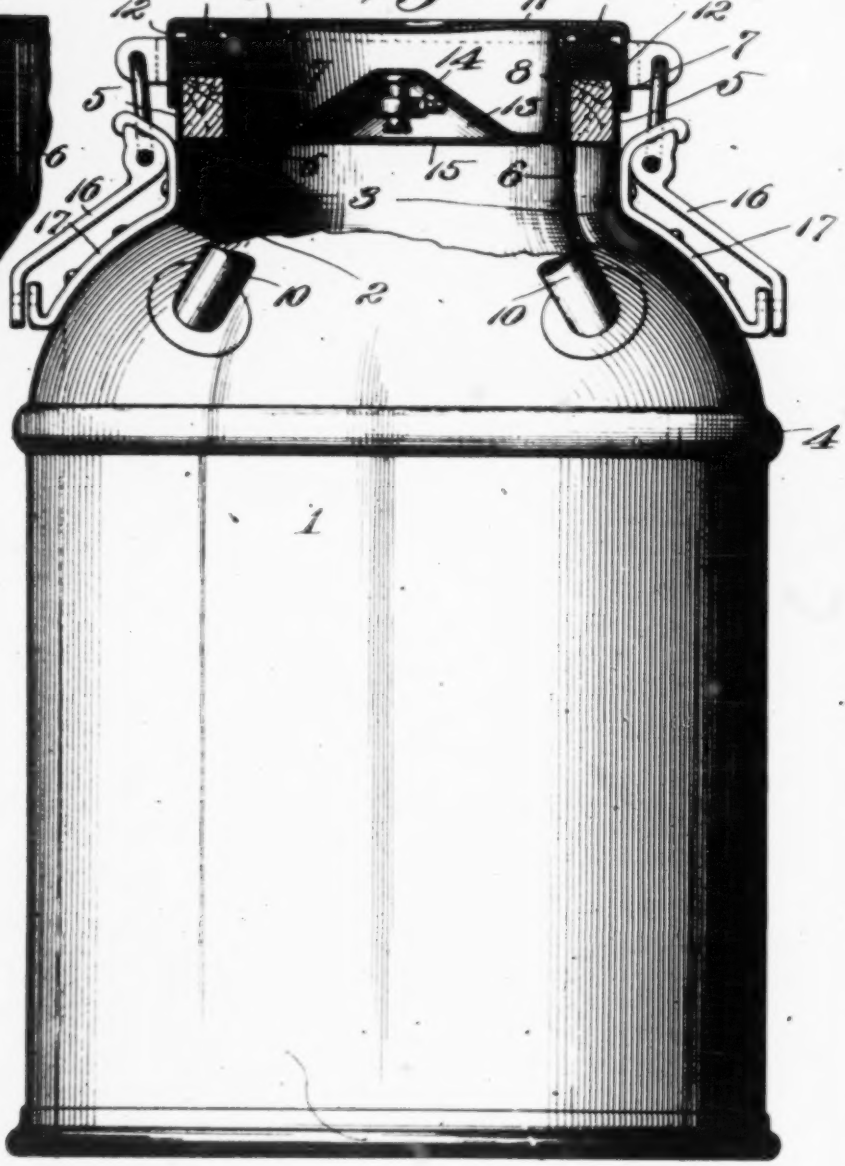


Fig. 1.



Witnesses:
Wm. A. Scott.
F. M. Harrington.

Inventor:
St. V. Le Sieur.
by Higdon & Longan,
Attys.

UNITED STATES PATENT OFFICE.

VRAIN LE SIEUR, OF EAST ST. LOUIS, ILLINOIS, ASSIGNOR TO THE LE SIEUR VACUUM CAN MANUFACTURING COMPANY, OF EAST ST. LOUIS, ILLINOIS, A ORPORATION OF ILLINOIS.

VACUUM MILK-CAN.

,968. Specification of Letters Patent. Patented Dec. 8, 1914.

al application filed September 5, 1911, Serial No. 647,719. Divided and this application filed April 19, 1913, Serial No. 691,930. Renewed December 8, 1913. Serial No. 805,348.

hom it may concern:

known that I, ST. VRAIN LE SIEUR, n of the United States, and resident St. Louis, St. Clair county, Illinois, vented certain new and useful Im- ents in Vacuum Milk-Cans, of which owing is a specification, containing a ar, and exact description, reference ad to the accompanying drawings, a part hereof.

nvention relates to improvements in milk cans, and it consists in the onstruction and combination of parts fter set forth and pointed out in the d claims.

bject of my invention is to provide roved vacuum milk can for use in g and storing milk and cream and ng the contents against fermenta- other deleterious effects caused by

ther object is to provide a vacuum which will be strong, durable, and construction, and which will be fficient and convenient in operation.

drawings: Figure 1 is a sectional of a milk can having my invention thereto; and Fig. 2 is a detail, sec- evation of a portion of the upper he can.

pplication is a division of my prior on filed September 5, 1911, Serial 719.

umeral 1 indicates the outer can, e inner can, the two cans being sep- a space 3 from which the air is d.

very important, in a vacuum milk the inner can be insulated from the , to prevent the conduction and of heat from the external can to al can, and in carrying out my in- have carefully insulated the inner at it will have no metallic connec- ever with the external can.

ter can 1 is made of very strong al and is provided at the base of t with the usual strengthening

ans for supporting and bracing n of the cans, forms no part of my nvention, and I have therefore limited the illustration herein to the details of the necks and cover.

The upper ends of the necks 5 and 6, of the outer and inner cans respectively, are held apart by a ring 7 of wood or similar non-conductive material, and upon the upper edge of said ring is placed a body of common cement 8, and a rubber ring 9 is mounted upon said body of cement and the upper edges of said necks are each turned inwardly and brought forcibly down upon said rubber ring, so that a portion of said rubber ring will project upwardly between the adjacent in-turned portions of the said necks and form a gasket for the cover to rest upon.

The can is provided with the usual form of handles 10.

The numeral 11 indicates a vacuum cover in the form of a hollow cylindrical body from which the air is exhausted. Said cover projects downwardly within the neck of the inner can to a point approximately even with the plane at the lower edge of said wooden ring 7, and the said cover is also provided with an exterior depending flange 12 which extends downwardly a considerable distance upon the neck of the outer can. Formed in the lower end of the cover 11 is a conical depression 13 in which is concealed and protected a common needle-valve 14, the outer end of the needle of which is adapted to be engaged by a common wrench or key, for the purpose of opening or closing said needle valve, in the operation of exhausting the air from the vacuum chamber of said cover. Said needle-valve is adapted to have connected to it in the usual way a hose (not shown) leading from any suitable vacuum pump or exhauster, to exhaust the air from said vacuum chamber. The said needle-valve 14 is concealed and protected within said conical depression 13 by means of a metal plate 15 removably fixed, by means of solder, on the lower end of said cover.

As I make no claim in the present application to means for exhausting the air from the space between the outer and inner cans, I have not shown a needle-valve for the said space, but will say that in practice another and separate needle-valve

UNITED STATES PATENT OFFICE.

ST. VRAIN LE SIEUR, OF EAST ST. LOUIS, ILLINOIS, ASSIGNOR TO THE LE SIEUR VACUUM CAN MANUFACTURING COMPANY, OF EAST ST. LOUIS, ILLINOIS, A CORPORATION OF ILLINOIS.

VACUUM MILK-CAN.

1,119,968. Specification of Letters Patent. Patented Dec. 8, 1914.

Original application filed September 5, 1911, Serial No. 647,719. Divided and this application filed April 19, 1913, Serial No. 691,930. Renewed December 8, 1913. Serial No. 805,348.

All whom it may concern:

Be it known that I, ST. VRAIN LE SIEUR, citizen of the United States, and resident of East St. Louis, St. Clair county, Illinois, have invented certain new and useful Improvements in Vacuum Milk-Cans, of which the following is a specification, containing a full, clear, and exact description, reference being had to the accompanying drawings, forming a part hereof.

My invention relates to improvements in vacuum milk cans, and it consists in the novel construction and combination of parts hereinafter set forth and pointed out in the appended claims.

The object of my invention is to provide an improved vacuum milk can for use in shipping and storing milk and cream and preserving the contents against fermentation and other deleterious effects caused by heat.

A further object is to provide a vacuum milk can which will be strong, durable, and cheap in construction, and which will be highly efficient and convenient in operation.

In the drawings: Figure 1 is a sectional elevation of a milk can having my invention applied thereto; and Fig. 2 is a detail, sectional elevation of a portion of the upper part of the can.

This application is a division of my prior application filed September 5, 1911, Serial No. 647,719.

The numeral 1 indicates the outer can, and 2 the inner can, the two cans being separated by a space 3 from which the air is exhausted.

It is very important, in a vacuum milk can, that the inner can be insulated from the outer can, to prevent the conduction and radiation of heat from the external can to the internal can, and in carrying out my invention I have carefully insulated the inner can, so that it will have no metallic connection whatever with the external can.

The outer can 1 is made of very strong sheet metal and is provided at the base of the breast with the usual strengthening hoop 4.

The means for supporting and bracing the bottom of the cans, forms no part of my present invention, and I have therefore limited the illustration herein to the details of the necks and cover.

The upper ends of the necks 5 and 6, of the outer and inner cans respectively, are held apart by a ring 7 of wood or similar non-conductive material, and upon the upper edge of said ring is placed a body of common cement 8, and a rubber ring 9 is mounted upon said body of cement and the upper edges of said necks are each turned inwardly and brought forcibly down upon said rubber ring, so that a portion of said rubber ring will project upwardly between the adjacent in-turned portions of the said necks and form a gasket for the cover to rest upon.

The can is provided with the usual form of handles 10.

The numeral 11 indicates a vacuum cover in the form of a hollow cylindrical body from which the air is exhausted. Said cover projects downwardly within the neck of the inner can to a point approximately even with the plane at the lower edge of said wooden ring 7, and the said cover is also provided with an exterior depending flange 12 which extends downwardly a considerable distance upon the neck of the outer can. Formed in the lower end of the cover 11 is a conical depression 13 in which is concealed and protected a common needle-valve 14, the outer end of the needle of which is adapted to be engaged by a common wrench or key, for the purpose of opening or closing said needle valve, in the operation of exhausting the air from the vacuum chamber of said cover. Said needle-valve is adapted to have connected to it in the usual way a hose (not shown) leading from any suitable vacuum pump or exhauster, to exhaust the air from said vacuum chamber. The said needle-valve 14 is concealed and protected within said conical depression 18 by means of a metal plate 15 removably fixed, by means of solder, on the lower end of said cover.

As I make no claim in the present application to means for exhausting the air from the space between the outer and inner cans, I have not shown a needle-valve for the said space, but will say that in practice another and separate needle-valve is provided for

said space, as shown and described in my prior application, Serial No. 647,719, previously referred to.

The cover 11, when in use, is adapted to be hermetically sealed in place on the upper end of the can necks, by being forcibly clamped in position upon said necks as shown, thereby flattening the rubber gasket 9, for such purpose.

The means for clamping the cover in position are the clamping levers 16 and the clamping and sealing brackets 17, which need not be described in detail, as they are not claimed herein specifically, but are specifically described and claimed in my prior application previously referred to.

The operation of my invention is obvious and need not be described further in details, except to say that milk placed within the inner can, at a lower temperature than the external aperture, will retain its temperature with but slight variation for a considerable period, since the space 3 presents a guard or protecting medium of an indifferent heat-conducting quality.

Milk cans constructed as described will be specially valuable in transportation, as they will serve to keep the milk in a fresh and cool condition throughout and after the period of transit. The wood ring 7 greatly strengthens the neck of the can.

I claim:

1. The improved milk can, comprising the outer and inner cans separated by a space from which the air is to be exhausted, necks for said cans, a wood ring located in the space between said necks, a body of cement also in said space on the upper surface of said wood ring, a compressible gasket also in said space above said body of cement, and the upper edges of the said necks turned inwardly to forcibly contact with said compressible gasket leaving a portion of the gasket free between said inturned edges, a suitable cover, and means for clamping said cover in position upon said gasket.

2. The improved vacuum milk-can, comprising an outer can and an inner can separated by a space from which the air is exhausted, a suitable gasket located in the space between said outer and inner cans at the upper ends of the latter and forming a non-metallic connection between the upper ends of said cans, and also acting as a gasket to hermetically seal a cover in position upon said gasket, and a vacuum-cover having a space from which the air is exhausted and hermetically sealed in position upon the said gasket.

In testimony whereof, I have signed my name to this specification, in presence of two subscribing witnesses.

ST. VRAIN LE SIEUR

Witnesses:
E. L. WALLACE,
JOHN C. HIGDON.

406

L. STURGES.

MILK CAN.

APPLICATION FILED NOV. 22, 1913.

1,161,266.

Patented Nov. 2

Fig. 1

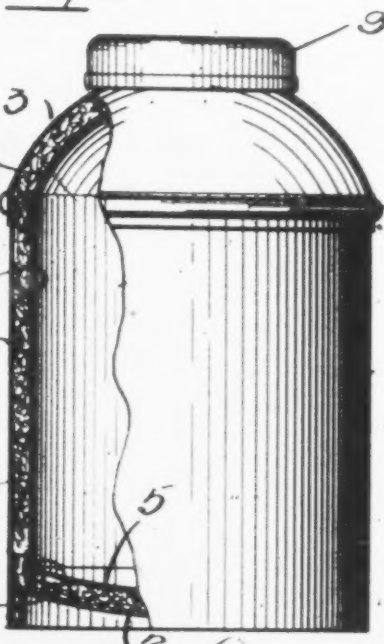


Fig. 3

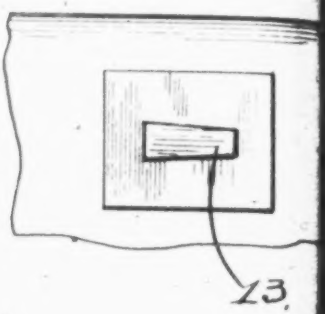


Fig. 4

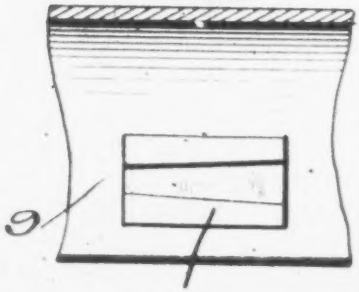
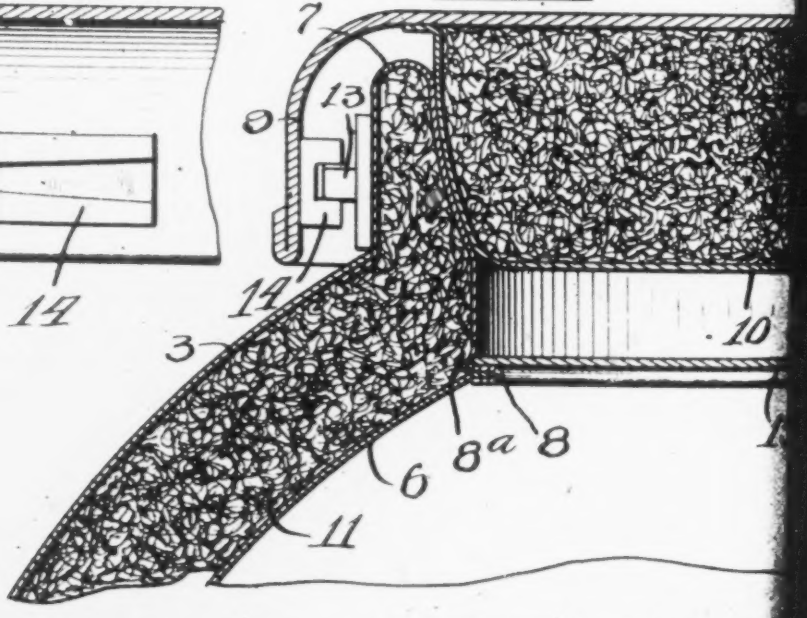


Fig. 2



Witnesses

J. W. Angell

Charles [illegible]

Inven

Lee Stu

by Charles [illegible]

UNITED STATES PATENT OFFICE.

LEE STURGES, OF CHICAGO, ILLINOIS.

MILK-CAN.

161,266. Specification of Letters Patent. Patented Nov. 23, 1915.

Application filed November 22, 1913. Serial No. 802,369.

ll whom it may concern:

e it known that I, LEE STURGES, a citi- of the United States, and a resident of city of Chicago, in the county of Cook State of Illinois, have invented certain and useful Improvements in Milk-Cans; I do hereby declare that the following full, clear, and exact description of the e, reference being had to the accompany- drawings, and to the numerals of refer- marked thereon, which form a part of specification.

ilk and cream is often caused to spoil become sour during the transfer thereof m place to place if the cans or receptacles taining the milk or cream, are not kept in roperly cooled place.

his invention relates to a milk can con- ction wherein suitable thermal insula- is provided associated with the can to ect the contents thereof from exterior perature changes and to maintain the ents at substantially the same tempera- as when placed within the can.

is an object of this invention to con- ct a double walled milk can in which pace between said walls is filled with a conducting material serving to insulate nterior of the can from the various heat ges on the exterior thereof.

is also an object of this invention to pro- a milk can consisting substantially of separate cans, one placed within the and spaced therefrom, thus affording nstruction capable of maintaining the nts within the inner can at substan- a constant temperature irrespective of ior temperature conditions.

is also an object of this invention to ruct a thermally insulated can provided an insulating cover adapted to be ed tightly thereon and with means af- ng an insulating dead air space be- the cover and the contents of the can.

is also an object of this invention to le a heat insulating container provided n insulating cover curved to fit into lementally curved opening in the con- such that inclination of the cover in ening will not affect the sealing func- hereof.

furthermore an object of this inven- construct a heat insulated container or other fluids, provided with an adapted to be clamped in tight relation thereon to close the same.

It is finally an object of this invention to provide a thermally insulated container of simple construction to preserve the contents of the container at a constant predetermined temperature.

The invention (in a preferred form) is hereinafter more fully described and defined in the accompanying drawings and specification.

In the drawings: Figure 1 is a front elevation of a can partly broken away, and shown in section. Fig. 2 is an enlarged, fragmentary sectional view of the upper portion of the device, illustrating the construction in detail. Fig. 3 is a front face view of a wedge or key, two or more of which are secured upon the outer periphery of the neck of the can. Fig. 4 is an inner face view of a portion of the cover for the device, illustrating one of the grooved or slotted members adapted to coöperate with the key members to lock the cover on the device.

As shown in the drawings: 1, indicates the outer wall of a container or can, having soldered, welded or riveted thereto, as desired, an inwardly concave bottom 2, and an outwardly convex breast member 3. Mounted within the can is an interior similarly shaped can having side walls 4, an inwardly concave bottom member 5, and a convex breast member 6, similar to the member 3, and adjacent thereto, said respective members 4, 5, and 6, being connected to one another by soldering or other suitable means, as desired. Said breast members 3 and 6, of the outer and inner can members respectively, are closed or joined at their upper margins by the mouthpiece member 7, affording the neck of the assembled structure. Said member 7, at one of its edges extends inwardly beneath the breast 3, and is soldered thereto, and at its other edge, is flanged inwardly over and around an inturned portion of the element 6, thus affording an inner peripheral flange 8, and a continuous groove or recess 8^a, within the can.

A cover 9, adapted to fit over the mouth piece of the can and extend downwardly around the neck thereof, has secured on the under surface thereof an upwardly facing cup 10, which fits within the mouth piece of the device to seal the same. The

LEE STURGES, OF CHICAGO, ILLINOIS.

MILK-CAN.

161,266. Specification of Letters Patent. Patented Nov. 23, 1915.

Application filed November 22, 1913. Serial No. 802,369.

all whom it may concern:

Be it known that I, LEE STURGES, a citi- of the United States, and a resident of city of Chicago, in the county of Cook State of Illinois, have invented certain and useful Improvements in Milk-Cans; I do hereby declare that the following full, clear, and exact description of the e, reference being had to the accompany- drawings, and to the numerals of refer- marked thereon, which form a part of specification.

Milk and cream is often caused to spoil become sour during the transfer thereof n place to place if the cans or receptacles taining the milk or cream, are not kept in roperly cooled place.

his invention relates to a milk can con- ction wherein suitable thermal insula- is provided associated with the can to ect the contents thereof from exterior perature changes and to maintain the ents at substantially the same tempera- as when placed within the can.

is an object of this invention to con- t a double walled milk can in which pace between said walls is filled with a conducting material serving to insulate nterior of the can from the various heat ges on the exterior thereof.

is also an object of this invention to pro- a milk can consisting substantially of separate cans, one placed within the and spaced therefrom, thus affording nstruction capable of maintaining the nts within the inner can at substan- a constant temperature irrespective of ior temperature conditions.

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It is finally an object of this invention to provide a thermally insulated container of simple construction to preserve the contents of the container at a constant predetermined temperature.

The invention (in a preferred form) is hereinafter more fully described and defined in the accompanying drawings and specification.

In the drawings: Figure 1 is a front elevation of a can partly broken away, and shown in section. Fig. 2 is an enlarged, fragmentary sectional view of the upper portion of the device, illustrating the construction in detail. Fig. 3 is a front face view of a wedge or key, two or more of which are secured upon the outer periphery of the neck of the can. Fig. 4 is an inner face view of a portion of the cover for the device, illustrating one of the grooved or slotted members adapted to coöperate with the key members to lock the cover on the device.

As shown in the drawings: 1, indicates the outer wall of a container or can, having soldered, welded or riveted thereto, as desired, an inwardly concave bottom 2, and an outwardly convex breast member 3. Mounted within the can is an interior similarly shaped can having side walls 4, an inwardly concave bottom member 5, and a convex breast member 6, similar to the member 3, and adjacent thereto, said respective members 4, 5, and 6, being connected to one another by soldering or other suitable means, as desired. Said breast members 3 and 6, of the outer and inner can members respectively, are closed or joined at their upper margins by the mouthpiece member 7, affording the neck of the assembled structure. Said member 7, at one of its edges extends inwardly beneath the breast 3, and is soldered thereto, and at its other edge, is flanged inwardly over and around an inturned portion of the element 6, thus affording an inner peripheral flange 8, and a continuous groove or recess 8^a, within the can.

A cover 9, adapted to fit over the mouth piece of the can and extend downwardly around the neck thereof, has secured on the under surface thereof an upwardly facing cup 10, which fits within the mouth piece of the device to seal the same. The walls of

the cup 10, and the inner walls of the mouthpiece 7, are complementally curved, the convexity of the cup and the concavity of the mouthpiece being spherical and of a radius equal substantially to the mean radius of the opening through the mouthpiece. This affords practically a ball and socket connection and permits the cover to be moved or inclined at different degrees relative the can without impairing the sealing effect thereof.

Any desired insulating material 11, such as ground cork, felt or the like, is packed in the space between the inner and outer container members and also within the cup 10, secured on the cover, so that a relatively thick wall of insulation entirely surrounds the contents of the can. In order to properly space the inner can from the outer can during the assembly thereof, wood or fiber or other non-conducting materials in the forms of small ring segment blocks 12, are placed on the bottom of the outer can adapting the inner can to rest thereon and to be properly centered prior to the introduction of the insulating packing 11.

For the purpose of closing the cover tightly upon the can, a pair of wedge shaped key members 13, are provided on the outer surface of the neck 7, and are adapted to coöperate with a pair of complemental members 14, having wedge shaped grooves or slots therein and secured on the inner periphery of the outer depending flange of the cover 9, so that after the positioning of the cover upon the device, partial rotation thereof about its vertical axis not only serves to engage the same tightly on the opening in the can, but to retain the same thereon until purposely released by a reverse rotary movement thereof. The purpose of the inturned flange 8, and groove 8^a, on the interior of the mouthpiece, is to receive a card or paper blank 15 thus affording an air space beneath the cover and sealing the contents of the can from dust or other foreign matter which might find its way into the contents of the can when the cover 9, is removed.

A bumper ring 16, is provided around the exterior of the can at the junction of the outer side walls and breast member to reinforce the same and protect the can in handling.

In this invention every precaution has been taken to avoid and prevent a transfer of heat between the inner can and the outer can. Only one metallic connection exists between the aforesaid two elements and this is at the opening or mouthpiece 7. But the conduction of heat even at this point is practically negligible owing to the provision of the air space between the cover cup member 10, and the paper blank 15. Furthermore, the depending flange forming the outer portion of the cover 9, is spaced from the mouthpiece 7, and serves to shield the same from light or heat which would warm this portion, and it being nearest adjacent the inner can, the heat would otherwise be quickly conducted thereto.

I am aware that various details of construction may be varied through a wide range without departing from the principles of this invention. I therefore do not purpose limiting the patent granted otherwise than necessitated by the prior art.

I claim as my invention:

1. In a device of the class described, a can, a mouth-piece, and a cover therefor, said mouth-piece and cover being complementally curved to permit interfitting when the axis of said cover is angled with respect to the axis of said mouth-piece without impairing the sealing effect thereof.

2. A milk can comprising inner and outer walls spaced from one another, a filling of heat insulating material therebetween, a non-conducting cover adapted to close the open end of the device and shaped complementally with said open end to afford an adjustable ball and socket connection, and locking means engaged on the can and cover adapted to coöperate to maintain the cover thereon.

3. In a device of the class described, an inner and outer container spaced one from another, a filling of insulating material therebetween, said inner container at its upper end being flanged inwardly, a mouthpiece secured to said outer container and flanged inwardly over said inturned portion of said inner container affording an inner peripheral groove and flange, and an insulating member sprung into said groove and resting on said flange, affording a closed air space in said mouth-piece.

In testimony whereof I have hereunto subscribed my name in the presence of two subscribing witnesses.

LEE STURGES.

Witnesses:
CHARLES W. HILLS, Jr.,
FRANK K. HUDSON.

410

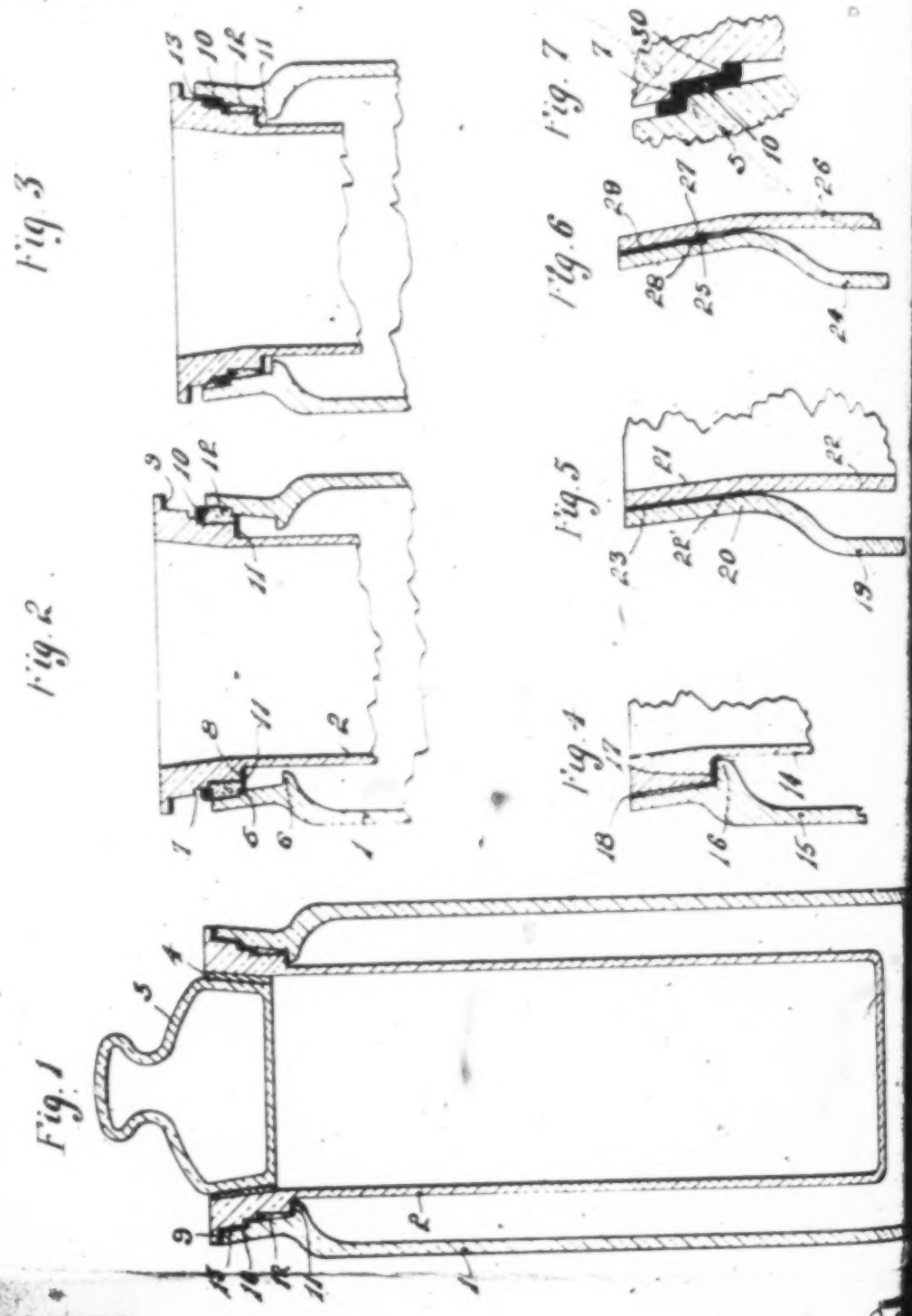
J. J. ENGEL.

VACUUM BOTTLE.

APPLICATION FILED DEC. 21, 1915.

1,199,772.

Patented Oct. 3, 1916.



WITNESS:

Julian H. Handley.

UNITED STATES PATENT OFFICE.

JOHN J. ENGEL, OF PITTSBURGH, PENNSYLVANIA.

VACUUM-BOTTLE.

,199,772. Specification of Letters Patent. Patented Oct. 3, 1916.

Application filed December 21, 1915. Serial No. 67,989.

all whom it may concern:

Be it known that I, JOHN J. ENGEL, a tizen of the United States, residing at ittsburgh, in the county of Allegheny and tate of Pennsylvania, have invented cer- in new and useful Improvements in Vac- m Bottles, of which the following is a ecification.

The invention relates to vacuum-bottles, d has for its primary objects: the provi- on of an improved bottle, (1) which may cheaply constructed, (2) which is ronger than the one-piece bottle as here- fore made, (3) which requires no support r the inner shell aside from the support the neck or top, and (4) which has a cure and enduring seal between the inner d outer shells. Certain embodiments of e invention are illustrated in the accom- nying drawings, wherein—

Figure 1 is a vertical section through my proved bottle. Figs. 2 and 3 are sections the upper portion of the bottle in two ges of the assembling operation. Figs. 4, and 6 are partial sections illustrating difications, and Fig. 7 is an enlarged sec- n showing a portion of the seal in the nstruction of Fig. 1.

In the construction of Fig. 1, the refer- ce numeral 1 indicates the outer glass ell, 2 the inner glass shell, and 3 the glass k from which the air has been exhausted d which is provided with a coating 4 cork to insure a tight joint between the k and the inner shell or casing 2.

As indicated in Figs. 2 and 3, the upper rtion of the outer shell 1 is provided h a pair of inwardly projecting annular lves 5 and 6, while the inner shell is ovided with a pair of opposing shelves shoulders 7 and 8, the purpose being to ure a tight joint between the inner and er shells as hereinafter set forth.

Resilient seals in the form of rubber bands 0 and 11 are employed, and after the air been exhausted from the vacuum mber containing the shells and while the rts are in the position illustrated in Fig. the liquid or plastic cement 12 is applied. this time the same vacuum exists be- een the two shells as that of the vacuum amber, and the inner shell is pressed wn to the position indicated in Fig. 3 and ore liquid cement 13 is applied above the l 10, and the application of this cement is continued until the inner shell is forced down to its final position as indicated in Fig. 1.

The joint between the two shells is thus provided with three rubber seals 9, 10 and 11, and two seals of cement 12 and 13, the cement being of such a character that it subsequently hardens, securely cementing the two shells together, and providing an air-tight seal.

The use of the cement is advantageous in that it not only adds to the security of the seal but also serves to protect the rubber seals 10 and 11 from the air. The resiliency of the rubber is thus retained for a much greater period and a perfect seal is insured as long as such resiliency endures. The rubber seals insure against a leakage of air while the cement seals are hardening, and gives a joint which is more perfect than that which can be secured with a cement seal alone, since it has been found to be almost impossible to secure a lasting seal with cement only. Another advantageous incident to the use of the rubber seals is that the inner shell is yieldingly supported and less liable to break than if such rubber seals were not used. The upper rubber seals also serve to protect the cement seals from the action of air and water.

The band or seal 10 is preferably circular in cross-section as indicated in Fig. 2, and when the inner shell is pressed into final position as indicated in Fig. 1, this band is deformed by the opposing shoulders 5 and 7 to the cross-section shown in Fig. 1, thus giving a very perfect seal. An additional small shoulder 30 is also preferably employed below the shoulder 7 as shown best in Fig. 7, such shoulder serving to pull down a portion of the rubber below the shoulder 5. The pressure of the air upon the inner shell tends to hold such shell in the position indicated in Fig. 1 during the period in which the cement is hardening, and the rubber seals as thus held under compression prevent any downflow of air or cement between the shells. The inner and outer shells can be thoroughly annealed before the assembling operation so that the bottle produced is strong and serviceable. The support of the inner shell at its upper end is such that no additional supports are required between the two shells below their upper ends and as a result the bottle is not

subject to the loss of efficiency due to the use of the usual pads or supports placed between the inner and outer shells.

Fig. 4 illustrates a modification in which the joint between the inner and outer shells 14 and 15 is simplified, there being only a single supporting shelf 16 and one rubber seal 17 above which the liquid or plastic cement 18 is applied.

In the construction of Fig. 5 the inwardly projecting support by the outer shell 19 is provided by the inclined end portion 20 which opposes the inclined portion 21 of the shell 22. Between these opposing portions is provided the rubber seal 22' and the cement seal 23.

Fig. 6 illustrates a modification of the structure of Fig. 5 in which the outer shell 24 is provided with a recess 25, and the inner shell 26 is provided with a recess 27. The rubber seal 28 fits in these recesses, being deformed by the sharp corners thereof, and a cement seal 29 is applied thereabove. Other modifications involving the same principle of invention might obviously be made.

What I claim is:

1. In combination in a vacuum bottle, an outer glass shell having a neck provided on its inner surface below the upper edge thereof with an inwardly projecting supporting portion, an inner glass shell having an open neck provided on its outer surface below the upper end thereof with a projecting portion opposing and lying above the said supporting portion, and a resilient seal interposed between said opposing portions.

2. In combination in a vacuum bottle, an outer glass shell having a neck provided on its inner surface below the upper edge thereof with an inwardly projecting supporting portion, an inner glass shell having an open neck provided on its outer surface below the upper end thereof with a projecting portion opposing and lying above the said supporting portion, a resilient seal interposed between said opposing portions, and a body of cement between the two necks above the resilient seal forming a permanent seal cementing the opposing surfaces of the necks together.

3. In combination in a vacuum bottle, an outer glass shell having a neck provided on its inner surface below the upper edge thereof with an inwardly projecting supporting portion, an inner glass shell having an open neck provided on its outer surface below the upper end thereof with a projecting portion opposing and lying above the said supporting portion, and a resilient seal interposed between said opposing portions, the inner shell being entirely supported at its neck.

4. In combination in a vacuum bottle, an outer glass shell open at its upper end and having a supporting portion on the surface of such upper end, an inner glass shell for the outer shell open at its upper end and having a supported portion on its outer surface below such upper end opposing the supporting portion, a resilient seal between the supporting and supported portions, a filling of cement above said seal and a resilient seal between the two shells above the cement.

5. In combination in a vacuum bottle, an outer glass shell having an inwardly projecting annular shoulder at its upper end, an inner glass shell fitting in the outer shell and provided with an annular shoulder lying above and opposing the first shoulder and also having another annular shoulder below both of the other shoulders, a resilient seal compressed between the two shells at the seal, such seal having its upper edge opposite the upper shoulder and the inner shell and its lower edge below the lower shoulder.

JOHN J. ENG

UNITED STATES PATENT OFFICE.

LIAM W. SIMONSON AND LEWIS V. D. BLAIR, OF CINCINNATI, OHIO, ASSIGNORS TO THE MANTLE LAMP COMPANY OF AMERICA, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

INDURATED ORGANIC SUBSTANCE AND PROCESS FOR PREPARING THE SAME.

09,967. Specification of Letters Patent. Patented July 15, 1919.

rawing. Application filed June 1, 1918. Serial No. 237,830.

ll whom it may concern:

e it known that we, WILLIAM W. SIMONand LEWIS V. D. BLAIR, citizens of the ted States, residing at Cincinnati, in the ty of Hamilton and State of Ohio, have nted certain new and useful Improvets in Indurated Organic Substances and esses for Preparing the Same, of which following is a specification.

ur invention relates to the induration toughening of organic substances which usually obtainable in the form of gums exudates, lac being an exudate of the to which the invention is applicable.

he invention consists in a chemical ess whereby such induration is initiated, also in a slightly indurated product; it further consists in a related thermal ess by means of which the slightly inted product is further indurated and n the great tenacity and adherence h certain uses require.

carrying the process into effect, the ral organic exudate is first relieved of mpurities, and, if it contains wax, may be rendered wax-free in a usual manby treatment in a hot solution of alkali, or instance caustic soda, finely divided n being used as a clarifying agent. If exudate be a lac (lac contains free s, resenes and esters of aleuritic acid), proportions of the ingredients of the ion may be 100 parts by weight of ac, 4.5 parts by weight of caustic soda 1600 parts by weight of water, the shellac slightly in excess of the quantity which ssolved, in order that all of the caustic will be utilized in neutralizing the acids of the shellac and no free caustic which may produce undesirable rens, will remain. The resulting product clarified solution of shellac constituents ater, the wax and other foreign subaving been removed.

ion is effected by mixing a clarion of the shellac sodium comove described, with lead acetate cient quantity of water to cause n of the resulting chemical prodis a shellac lead compound, the approximately Pb ($C_{46}H_{71}O_{12}$) 2), to appear as small flakes which may be easily washed and freed from excess lead acetate and the sodium acetate produced by the reaction. The proportions of the substances in this solution are 100 parts by weight of the shellac sodium compound, 22.5 to 25 parts by weight of lead acetate, and water in the stated quantity. The flakes of the shellac lead compound are strained off and then dried in any convenient manner. These flakes are an indurated gummous product.

This product, if subjected to heat and fused, will become tough and further indurated, and if applied while fused to a solid material and heat treated while in contact with said material will solidify and adhere strongly thereto. Prolonged heating preceding fusion should be avoided. Heating after fusion, either at a constant temperature or at variable temperatures, effectuates elimination of constitutional water, produces polymerization and increases the viscosity of the fused and adherence of the solidified compound. The period of treatment should vary according to the mass treated. If the mass under treatment is of considerable magnitude, heat should be gradually applied so that incrustation of the surface of the mass will be avoided and free escape of the volatilized constituents permitted. The temperature during the maturing period may be controlled to avoid rapid vaporization, so that if desired, a substantially non-porous product may be produced. The elimination of the constitutional water is accompanied by polymerization, condensation, and hardening, but is not attended by substantial volatilization of the organic constituents of the compound. This is true not only as regards the initial fusion temperature, but successively higher fusion temperatures. If the the gummous substance under treatment is shellac, the product will be a shellac lead compound which fuses at about 240° F. While certain results may be attained by employing shellac containing the natural wax, it is preferable to use wax-free commercial shellac in order that the indurated product may not contain a substance which

will affect its toughness, elasticity or adherence.

When a dry mass of the compound is fused, it will adhere to a contacting surface. Prolongation of the heat treatment increases the tenacity of the mass even if the temperature be not raised, but greater tenacity and adhesion are secured and the maturing period shortened, by maintaining the temperature above the point of initial fusion. These conditions apply to the matturing of substances fusing at different temperatures.

A superior compound may be produced by mixing the shellac lead compound with wax-free shellac. The wax-free shellac is obtained by taking a portion of the above described clear solution of shellac sodium compound and adding thereto a small excess of acid such as hydrochloric acid, in order to eliminate the sodium in the form of a soluble salt, and precipitate the shellac. The shellac lead compound and the wax-free shellac are preferably mixed in the proportion of one part by weight of the shellac lead compound, and two parts by weight of the wax-free shellac. Further induration and toughening of this compound may be thermally produced in the manner above described.

The temperature of fusion of the compound may be varied by changing the proportions of its components, the fusion point being raised by increasing the relative quantity of the metallic derivative and also being widely varied by the substitution of different methods in the metallic derivative. For instance, a calcium compound has an appreciably higher initial melting point than a similar compound made with lead, the difference between the initial fusion points of these two compounds being approximately 100° F. When a product having a low initial fusion temperature is desired, a lac without a metallic substitution may be subjected to the thermal process as described.

The temperature of fusion of the compound may be varied by the introduction of kindred gummous substances, or wholly or partially polymerized materials. The fluency of the mass may also be varied by the introduction of substances which are comparatively inert in the composition, such as talc and calcium sulfate. Charcoal may be added either as a substitute for or in addition to these substances. The use of charcoal possesses the additional advantage of qualifying the elimination of the volatilized substances, and shortening the period of time necessary to satisfactorily complete the process of polymerization and maturing. This feature of influencing the ebullition of the compound during fusing facilitates the solidification of the compound and permits the production of a substantially non-porous product in a shorter period of time than is requ... vaporization of the volatile cons... controlled by temperature alone.

Barium, calcium, magnesium, a... zinc and other metals may be subs... lead, such metals being obtained f... salts as previously described and the... treated by the thermal process. ... proximate initial fusing temperat... lead compound is 240° F., of the ba... pound 285° F.; of the calcium c... 340° F., and of the magnesium c... 260° F.

An alkali-shellac compound is obt... evaporating to dryness the clarified ... above described, and the dessicated ... may be indurated by the heat treatm... in described.

An alternative method of prepar... metallic derivative of shellac (or g... exudate), consists in dissolving the ... in a solvent, such as alcohol or aceto... ing a sufficient quantity of the desi... hydrate, mixing or agitating to ... chemical combination and evaporat... solvent.

In the case of all of the above d... compounds, polymerization ceases ... composition begins at substantially ... the organic constituents being un... this temperature.

The indurated product either b... after having been fused may be a... with a vehicle such as a solvent and ... as a varnish.

The thermally threaded, elastic, i... and toughened product is insolubl... soluble in alcohol and alkaline sol... not appreciably softened at 212° F... pervious to air and possesses sub... the tenacity of glass.

When, in the claims, we use the ... "organic exudate" we refer not o... organic exudate, as such, which ... become altered by external influen... the unchanged sap or secretion fr... the exudate is derived, or to a ... artificially produced from said sap ... tion.

By "derivative" we mean the or... date freed from impurities, or th... exudate associated or combined ... or kindred substances or metals.

In the case of shellac, the emp... mula is $C_{40}H_{72}O_{12}$. Loss of hy... oxygen atoms leaves the empiric... as $C_{40}H_{64}O_8$.

Having thus described our inv... we claim and desire to secure ... Patent is:

1. The process of producing a ... durated organic metal compound ... sists in subjecting a lac to the ... chemical agent to produce a me...

and subjecting said metal shellac
nd to the action of the salt of an-
etal to effect substitution of the metal
salt for the metal of the shellac com-

e process of producing a desired in-
shellac metal compound, which con-
subjecting shellac to the action of
soda in solution, to produce a sodium
compound, and subjecting said sodi-
llac compound to the action of the
another metal in solution to effect
ution of the metal of said salt for the

e process of producing a desired in-
organic metal compound, which
s in subjecting a lac exudate to the
of a chemical agent to produce a
lac compound, subjecting said metal
pound to the action of the salt of an-
metal to effect substitution of the metal
salt for the metal of the shellac com-
and treating the precipitate by heat
plete its induration.

e process of producing a desired in-
shellac metal compound, which con-
subjecting shellac to the action of
soda in solution, to produce a sodium
compound, subjecting said sodium
compound to the action of a metal
solution to effect substitution of the
of said salt for the sodium, and treat-
precipitate by heat to complete its
tion.

e process of producing a desired in-
metal compound from a gummous
nce, which consists in combining a
ous exudate with a selected metal to
metallic derivative of the gummous
e, and subjecting the resulting prod-
heat treatment to complete the indu-

process which consists in heating an
olved non-volatile natural gummous
al to the melting point and continu-
heating of the material until altera-
the constituents sufficient to raise the
g point of the material, is effected.

process, which consists in heating an
olved material, including a gummous
nce, and a metallic derivative of a
ous substance to the melting point,
ntinuing the heating of the material
lteration of the constituents sufficient
e the melting point of the material,
ted.

process of raising the melting point
material including a gummous sub-
and a metallic derivative of a gum-
ubstance, consisting of fusing the ma-
and continuing heating until poly-
tion is effected.

e process of induration, which con-
ubjecting an organic exudate to the heat of fusion, and to subsequent heat treatment sufficiently prolonged to effectuate alteration of the chemical constituents and produce the desired induration.

10. The process of indurating an undissolved organic substance containing a chemically combined metal, which consists in subjecting said substance to heat treatment, thereby altering the relations of its constituents and effecting polymerization.

11. The process of induration, which consists in subjecting an organic substance containing an ester and resene to heat treatment to alter the constituents thereof.

12. The process of producing a substantially non-porous polymerized product, which consists in fusing a gummous substance, and so controlling the temperature during the period of polymerization as to avoid rapid vaporization of volatile constituents.

13. The process of producing a substantially non-porous polymerized product, which consists of fusing a gummous substance containing charcoal.

14. The process of producing a substantially non-porous polymerized product, which consists in fusing and thereby polymerizing a gummous substance and controlling ebullition during the period of polymerization.

15. The process of producing an indurated fusible material consisting in polymerizing a metallic derivative of an organic exudate.

16. The process of producing a desired indurated lac compound, which consists in subjecting lac to the action of an alkali to eliminate the wax constituent, and in polymerizing constituents of the resulting compound.

17. The process of producing an indurated product, which consists in subjecting a mixture of dissimilar polymerizable substances to heat treatment continued until said substances are converted into one homogeneous polymerized mass.

18. An indurated, substantially non-porous, polymerized, gummous exudate.

19. A polymerized product of an unpolymerized exudate, having a higher melting point than the unpolymerized organic exudate.

20. A polymerized product of an organic exudate, having a higher melting point than the unpolymerized exudate.

21. An indurated polymerized product, including an organic exudate, the polymerized product having a higher melting temperature than the unpolymerized exudate.

22. A gummous organic exudate, polymerized by heat treatment to form a material having a melting temperature higher than that of the untreated organic exudate.

23. A material, including a heat polymerized gummous exudate capable of solution in alcohol and other well-known solvents of resins, which polymerized exudate on evaporation of such solvents may be further polymerized.

24. A material composed of gummous exudates, one of which has been partially polymerized, said material being capable of solution in alcohol and other well-known solvents of resins, and, on evaporation of such solvents, of being further polymerized.

25. A heat polymerized material, including a gummous organic exudate, and a derivative of a gummous material, the melting point of which may be gradually raised by heat treatment.

26. A heat polymerized material, including a gummous organic exudate, and a derivative of said substance, the fusing point of which material may be raised by heat treatment.

27. A polymerized material including a gummous organic exudate and a derivative of a gummous substance, the adherent property of which material may be gradually increased by heat treatment.

28. A heat polymerized material, including a gummous exudate and a metallic derivative of a gummous material, capable of solution in alcohol and other well-known solvents of resins.

29. A heat polymerized material, including a gummous exudate and a metallic derivative of a gummous material, capable of solution in alcohol and other well-known solvents of resins, and which on evaporation of such solvents may be further polymerized.

30. A substantially non-volatile fusible material, including a metallic derivative of an organic exudate and capable of polymerization by heat treatment.

31. A substantially non-volatile fusible material, including a lead derivative of an organic exudate and capable of polymerization by heat treatment.

32. An undissolved substance, including a metal derivative of an organic exudate, which substance upon fusion is capable of adherence to solids and, once having been fused, is capable, by heat treatment, of being rendered abnormally adherent to solids.

33. A compound, composed of an organic exudate and a metallic element chemically combined therewith, and capable of attaining its highest fusion point and of eliminating its constitutional water, without substantial volatilization of its organic constituents.

34. A heat polymerized product of wax-free lac, the melting point of which may be raised by heat treatment at a constant temperature.

35. A heat polymerized product of lac, the melting point of which may be raised by heat treatment at a constant temperature.

36. A heat polymerized product of lac, the melting point of which may be progressively raised by heat applied at successively higher temperatures.

37. A heat polymerized product of wax-free shellac, the melting point of which may be progressively raised by heat applied at successively higher temperatures.

38. A heat polymerized material, including lac and a derivative of a gummous material the melting point of which may be raised by heat treatment.

39. A polymerized shellac product, including a derivative from an organic exudate and having a higher melting point than shellac.

40. A condensed indurated derivative of an organic exudate, infusible at the temperature of boiling water and capable of being fused after fusion and solidification.

41. A polymerized metal lac compound.

42. A mixture, consisting of shellac and a metallic derivative of an organic exudate which derivative has been subjected to heat treatment, to increase the melting temperature of the mixture.

43. A compound consisting of shellac and a metallic derivative of a gummous organic exudate, the melting temperature of which mixture has been raised by heat treatment.

44. A polymerizable organic compound containing esters of aleuritic acid, an insoluble substances designated as resenes, and a metallic element combined with the radical of an organic acid to produce a salt.

45. A polymerizable organic compound containing esters of aleuritic acid, an insoluble substances designated as resenes, and a metallic element combined with the radical of an organic acid to produce a salt having the mutual affinities of its constituents completely satisfied.

46. A fusible mixture, consisting of an organic exudate, and a gas occluding substance which facilitates the solidification of the fused mixture.

47. An undissolved organic exudate including a material which influences solidification and facilitates solidification of the exudate during polymerization.

48. A polymerized solid, containing carbon, hydrogen, oxygen and a metal, insoluble in alcohol and alkaline solutions, having a high temperature of dissociation, infusible at 212° F., and initially fusible at temperatures ranging from approximately 150° upward, according to the contained metal, resilient, impervious to air, capable of cohering to solids under pressure and heat.

49. The process of indurating an organic exudate, which consists in subj

ivative thereof to heat treatment, at a fusion temperature for such length of time, as to alter the relations of its constituents to effect polymerization, and thereby increase its tenacity and adhesion.

50. An indurated non-volatile converted gummous exudate, characterized by containing a different number of hydrogen and oxygen atoms than the original exudate.

51. An indurated non-volatile converted gummous exudate, characterized by containing a lesser number of hydrogen and oxygen atoms than the original exudate.

In testimony whereof we affix our signatures.

WILLIAM W. SIMONSON.
LEWIS V. D. BLAIR.

Witnesses:
CHARLES E. BULTEN,
HARRY E. MALI.

Corrections in Letters Patent No. 1,309,967.

It is hereby certified that in Letters Patent No. 1,309,967, granted July 15, 1919, upon the application of William W. Simonson and Lewis V. D. Blair, of Cincinnati, Ohio, for an improvement in "Indurated Organic Substances and Processes for Preparing the Same," errors appear in the printed specification requiring correction as follows: Page 2, line 36, for the word "method" read *metals;* same page, line 100, for the word "threaded" read *treated;* page 3, line 1, claim 1, for the word "shellac" read *lac;* same page, line 115, claim 19, before the word "exudate" insert the word *organic;* same page and claim, line 116, strike out the word "organic"; and that the said Letters Patent should be read with these corrections therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 20th day of January, A. D., 1920.

[SEAL.]

M. H. COULSTON,
Acting Commissioner of Patents.

Cl. 134—26.

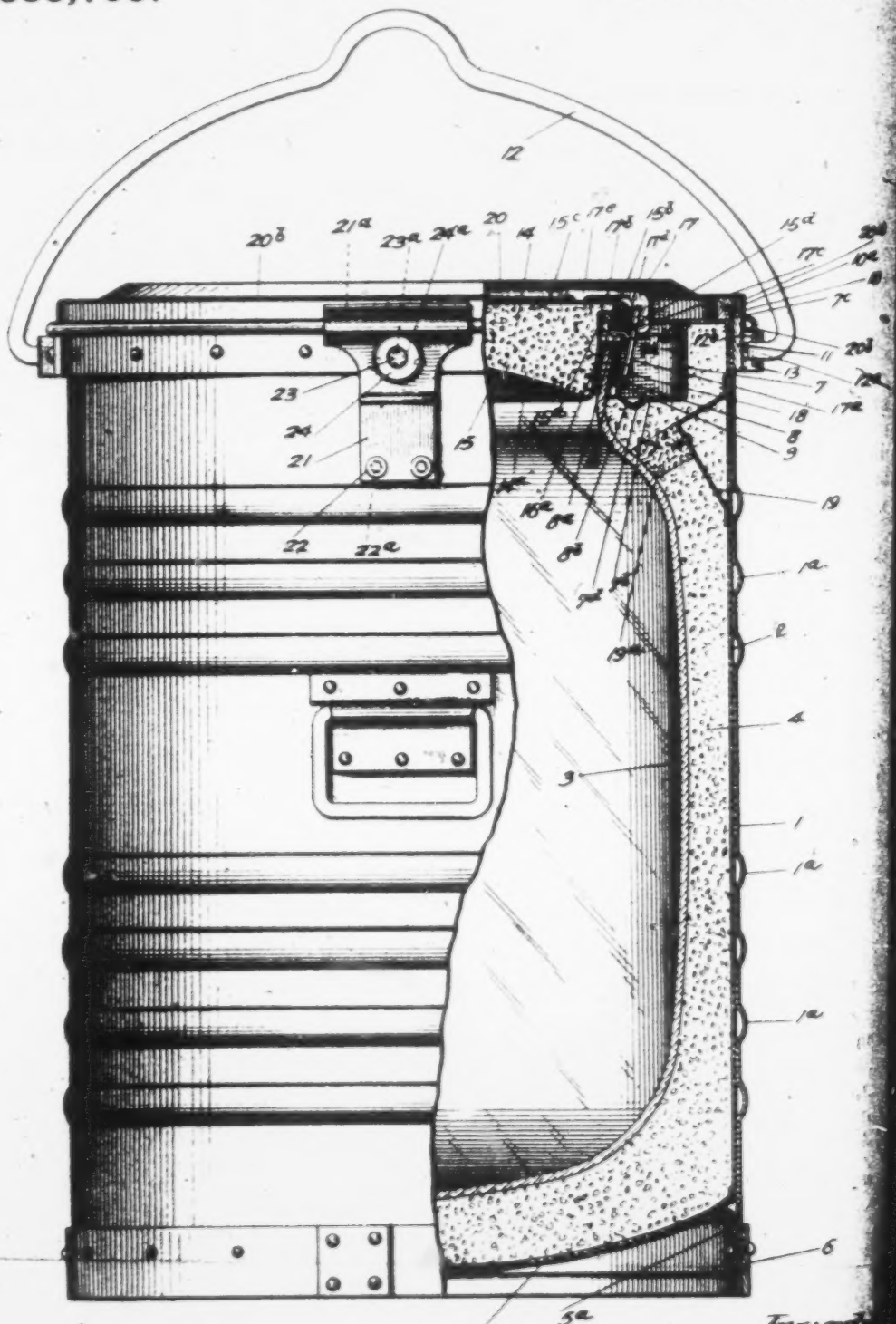
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C. W. DAVIS AND F. R. SUNDERLIN.

INSULATED VITREOUS RECEPTACLE.

APPLICATION FILED NOV. 7, 1918.

1,333,795. Patented Mar. 16, 1920.



Inventors
C. W. Davis and F. R. Sunderlin
by Edson & Stewart
Attorneys

UNITED STATES PATENT OFFICE.

RTLAND W. DAVIS AND FRANK R. SUNDERLIN, OF CHICAGO, ILLINOIS, ASSIGNORS TO THE MANTLE LAMP CO. OF AMERICA, A CORPORATION OF ILLINOIS.

INSULATED VITREOUS RECEPTACLE.

333,795. Specification of Letters Patent. Patented Mar. 16, 1920.

Application filed November 7, 1918. Serial No. 261,823.

all whom it may concern:

Be it known that we, CORTLAND W. DAVIS d FRANK R. SUNDERLIN, citizens of the ited States, residing at Chicago, in the nty of Cook and State of Illinois, have ented certain new and useful Improvents in Insulated Vitreous Receptacles; d we do hereby declare the following to a full, clear, and exact description of the ention, such as will enable others skilled he art to which it appertains to make and the same.

Our invention relates to insulated vitreous eptacles, objects thereof being to render containers of such receptacles immune, far as possible, from external thermal inences, and also to shield them from blows shocks which are incident to transporta- and use. The container of the receptacle for sanitary reasons, preferably made of eous material, such as glass, and a fur- object is, therefore, to so construct the r parts of the receptacle that, when the ainer is broken, these parts may be reed therefrom and replaced by new parts. removability of the container and its ciated parts admits of the restoration of receptacle by a substitution of new parts. eferring to the drawings—

is a non-vitreous protective jacket, preferably made of sheet metal, rolled and bent cylindrical form, the edges of the sheet g overlapped, riveted and soldered toer in a usual manner.

is an inner lining or jacket, and 3 is a ed vitreous container, between which the inner lining 2 is a space for the reion of a non-heat conducting filling 4, h is preferably granulated cork, algh it may be composed of any suitable insulating material. The film of silver he container is protected by a suitable ing.

e jacket 1 is provided with a number ooves 1ª which not only strengthen said t but provide shock insulating spaces een it and the lining 2.

e bottom 5 of the jacket 1 is provided a downwardly extending flange 5ª h is riveted and soldered to the lower f the jacket 1. Surrounding the lower of the jacket 1 is a heavy metal ring 6 ituting a support for the entire recep-

annular diaphragm 7 composed of posed between the lining 2 and the container 3, at their upper ends. This diaphragm has a cylindrical body portion 7ª, an internal flange 7ᵇ and an external flange 7ᶜ. The external flange extends downward a short distance outside the lining 2, to which it may be secured by solder, and the internal flange has a deflected edge 7ᵈ. A collar 8, having an inwardly extending flange 8ª at its upper end and an outwardly extending flange 8ᵇ at its lower end, is secured to the neck of the vitreous container by a suitable bonding substance 9. The deflected edge 7ᵈ of the diaphragm 7 overlaps the outwardly extending flange 8ᵇ of the collar 8 and is secured thereto by solder. The flange 8ᵇ is V-shaped so as to constitute a gutter which assists in the soldering operation.

The lining 2, container 3, the filling 4, the diaphragm 7 and the collar 8, constitute a removable unit which, if necessary, may be separated from the jacket 1 and replaced by another unit. While the frangible container is so well protected by the environing parts of the device as not to be easily broken, even if the device is subjected to rough handling, it is possible that it may be broken or punctured under the severe conditions which often attend transportation. For this reason the diaphragm 7 is made in such form that it may yield to external shocks without transmitting the same in any considerable degree to the frangible container 3. The protective quality of the diaphragm is enhanced by making it of copper or some other yieldable substance which will become distorted by a blow, without transmitting much of the energy of the blow to the container.

The lining 2 is preferably made of some yieldable substance, such as thin sheet steel coated with lead or tin, the object being to admit of the withdrawal of the lining and the associated parts, even though the protective jacket has become deformed to such an extent that, if made of rigid material, it would prevent the withdrawal of such lining. Should there be difficulty in removing the lining by an endwise movement, the broken parts of the container and the filling may first be removed, and a suitable tool then applied directly to the lining in order to free it from any interlocking portions of the protective jacket.

TLAND W. DAVIS AND FRANK R. SUNDERLIN, OF CHICAGO, ILLINOIS, ASSIGNORS TO THE MANTLE LAMP CO. OF AMERICA, A CORPORATION OF ILLINOIS.

INSULATED VITREOUS RECEPTACLE.

33,795. Specification of Letters Patent. Patented Mar. 16, 1920.

Application filed November 7, 1918. Serial No. 261,528.

ll whom it may concern:

Be it known that we, CORTLAND W. DAVIS and FRANK R. SUNDERLIN, citizens of the ited States, residing at Chicago, in the nty of Cook and State of Illinois, have ented certain new and useful Improvents in Insulated Vitreous Receptacles; we do hereby declare the following to a full, clear, and exact description of the ention, such as will enable others skilled he art to which it appertains to make and the same.

Our invention relates to insulated vitreous eptacles, objects thereof being to render containers of such receptacles immune, far as possible, from external thermal inences, and also to shield them from blows shocks which are incident to transportaand use. The container of the receptacle for sanitary reasons, preferably made of reous material, such as glass, and a fur object is, therefore, to so construct the er parts of the receptacle that, when the ainer is broken, these parts may be reed therefrom and replaced by new parts. removability of the container and its ciated parts admits of the restoration of receptacle by a substitution of new parts.

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The lining 2, container 3, the filling 4, the diaphragm 7 and the collar 8, constitute a removable unit which, if necessary, may be separated from the jacket 1 and replaced by another unit. While the frangible container is so well protected by the environing parts of the device as not to be easily broken, even if the device is subjected to rough handling, it is possible that it may be broken or punctured under the severe conditions which often attend transportation. For this reason the diaphragm 7 is made in such form that it may yield to external shocks without transmitting the same in any considerable degree to the frangible container 3. The protective quality of the diaphragm is enhanced by making it of copper or some other yieldable substance which will become distorted by a blow, without transmitting much of the energy of the blow to the container.

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A shock resisting and retaining ring 10 is

secured in position by screws 10ª extending through holes in a reinforcing band 11 which encircles the upper end of the jacket 1. This shock resisting and retaining ring, not only locks or secures the lining 2 and the container 3 within the protective jacket 1, but operates to relieve the container 3, to a considerable extent, from the effect of the shocks which instead of reaching it are transmitted from one side of the protective jacket to the other.

The receptacle is provided with a bail 12, the ends 12ª of which are arranged to oscillate in holes formed in lugs 13 secured to the reinforcing band 11. The ends of the bail are secured by cotter pins 12ᵇ which prevent their withdrawal from the holes in the lugs 13.

The container 3 is provided with a cover 14, the body portion of which consists of a mass of cork 14ª or any other suitable heat insulating substance. The inner face of this cover is provided with a sheathing 15 having a flange 15ª which extends upward around the body of the cover and terminates in an outwardly extending flange 15ᵇ. The cover is provided with a protective cap 15ᶜ having a downwardly extending flange 15ᵈ spaced apart a slight distance from the outer edge of the flange 15ᵇ. Within and fitting the flange 15ᵈ is a sheet metal ring 16 having a flange 16ª which is secured to the flange 15ᵈ by solder 16ᵇ. The space between the protective cap 15ᶜ and the flange 15ᵇ of the sheathing 15 is filled with cork which may be a continuation of the main body of cork for the cover 14. In assembling the parts of the cover, the protective cap 14 and the sheathing 15 are forced together by any suitable means, thereby compressing the body of cork into which the flange 15ª extends. The pressure may be exerted through the ring 16 and the mass of cork which separates it from the flange 15ᵇ, the soldering of the ring 16 to the flange 15ᵈ of the cap being effectuated after the various parts are brought into proper relation to each other, so as to retain them in that relation. After the cover is thus far completed, the annular space below the ring 16 is filled with cork which, when the cover is applied to the receptacle, bears upon the top of the collar 8 to thereby hermetically close the container 3. The only contact between the cover and the container is, therefore, through the medium of a substance having low heat conductivity. The sheathing 15 is anchored by means of its flange 15ᵇ in the body of cork, and is elsewhere spaced from the container. Furthermore, the flange 15ᵈ of the protective cap 15ᶜ is always heat insulated from the collar 8 and the container 3. It is extremely de-

heat by conduction, since a gradual [illegible] heat, even though restricted, will [illegible] course of a relatively short time ma[illegible] reduce the temperature of the co[illegible] and its contents. The under side [illegible] sheathing is concaved, as shown, [illegible] liquid contents of the container [illegible] splashing about within the same may [illegible] flected away from the space betwee[illegible] protective cover and the container.

The protective cap is secured in p[illegible] by a locking device 17 consisting of a [illegible] 17ª and a lever 17ᵇ oscillating on a [illegible] 17ᶜ secured to a lug 17ᵈ. A headed p[illegible] secured to the receptacle is adapted [illegible] engaged by the link 17ᵉ. The lever 1[illegible] bent at right angles so that its fre[illegible] 17ᵉ may rest upon the top of the cover [illegible] the lever 17ᵇ is actuated.

The inner lining 2 is provided with a[illegible] ternal seat 19 sustaining a brace 19ª [illegible] a diagonal disposition to prevent the [illegible] parts of the receptacle from moving [illegible] within said jacket.

The entire receptacle is closed by a [illegible] 20 having a flange 20ª snugly fitting [illegible] the reinforcing band 11, the edge o[illegible] flange being provided with a bead 20ᵇ [illegible] which a pivoted clamp 21 is adapted [illegible] gage. The clamp 21 has an inside g[illegible] 21ª which is adapted to fit said be[illegible] The pivot of the clamp 21 is form[illegible] headed rivets 22 which loosely fit o[illegible] 22ª in the lower end of the clamp. [illegible] 23, fixedly secured to the reinforcing [illegible] 11 and threaded at its outer end, is e[illegible] by a thumb nut 24 by means of wh[illegible] clamp may be forced into engagem[illegible] the bead 20ᵇ. The thumb nut 24 is p[illegible] with an external central depression [illegible] sufficient size to receive a head 2[illegible] which the bolt 23 is provided. The h[illegible] prevents the thumb nut from being [illegible] removed from the bolt 23, but the [illegible] sion in the thumb nut allows the s[illegible] unscrewed to a sufficient extent to [illegible] the bead 20ᵇ from the groove 2[illegible] clamp. It is proposed to employ a[illegible] of these pivoted clamps as may be [illegible] necessary.

Having thus described our [illegible] what we claim as new and des[illegible] cure by Letters Patent is:

1. A receptacle including an o[illegible] and a removable shock insula[illegible] vitreous container having as a p[illegible] a heat insulating body and the [illegible] sulating means.

2. A receptacle, including an o[illegible] a vitreous container and an in[illegible] said inner jacket being composed [illegible] able substance.

3. A receptacle, including an o[illegible] an inner container of frangib[illegible]

secured in position by screws 10^a extending through holes in a reinforcing band 11 which encircles the upper end of the jacket 1. This shock resisting and retaining ring, not only locks or secures the lining 2 and the container 3 within the protective jacket 1, but operates to relieve the container 3, to a considerable extent, from the effect of the shocks which instead of reaching it are transmitted from one side of the protective jacket to the other.

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The protective cap is secured in p... by a locking device 17 consisting of ... 17^a and a lever 17^b oscillating on ... 17^c secured to a lug 17^d. A headed ... secured to the receptacle is adapte... engaged by the link 17^e. The leve... bent at right angles so that its fr... 17^e may rest upon the top of the cov... the lever 17^b is actuated.

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2. A receptacle, including an o... a vitreous container and an i... said inner jacket being composed ... able substance.

3. A receptacle, including an o... an inner container of frangible ... inner jacket, and a shock insu...

ragm disposed between said container said inner jacket, said container, said r jacket and said diaphragm being re- vable as a unit from the outer jacket.

A receptacle, including an outer jacket, inner frangible container, a collar se- d to said container, a shock insulating phragm secured to said collar, and an r jacket secured to said diaphragm, container, the collar, the diaphragm and inner jacket being removable as a unit m said outer jacket.

A receptacle including an outer jacket, inner frangible container, a shock in- ting diaphragm, an inner jacket and a nforcing and retaining ring, the con- er, the diaphragm, the inner jacket and ring being removable from said outer et.

A receptacle including an outer jacket, nitary shock and heat insulated inner gible container, and a reinforcing ring osed within said outer jacket.

A receptacle including an outer jacket, nitary shock and heat insulated inner gible container, and a reinforcing ring osed within said outer jacket, and a re- rcing band encircling said outer jacket.

A receptacle including an outer pro- ve jacket, an inner jacket, a container shock insulating means, the inner jacket, container and the shock insulating means tituting a removable unit.

A heat insulated receptacle including uter protective jacket, an inner jacket, ntainer and shock insulating means ad- nal to the container and inner jacket uniting the inner jacket and the con- r.

A receptacle including an outer jacket sing a removable unitary shock insu- frangible container.

A heat insulated receptacle including uter jacket inclosing a removable uni- shock insulated frangible container.

An insulated receptacle comprising an protective jacket and a removable in- ing unit, said unit including a jacket a container, said jacket and container united at their upper ends by a shock ating diaphragm closing the space be- them.

An insulated receptacle comprising uter protective jacket and a removable ating unit, said unit including a jacket a container, said jacket and container united by a shock-insulating dia- m, the space between the container he jacket containing heat insulating ial.

An insulated receptacle comprising an protective jacket and a removable unit, said unit including a jacket

phragm, the space between the container and the jacket containing heat insulating material, the insulating unit being removable through the top of the outer protective jacket.

15. A receptacle including a protective jacket, a removable inner jacket, insulating material within said inner jacket, a container resting against said insulating material, and shock-insulating means for holding said insulating material within the space between the inner jacket and the container.

16. A receptacle including a protective jacket, and a composite insulating unit comprising an inner jacket and a frangible container flexibly united to each other.

17. A heat insulated vessel having an insulated corkage unit, said unit having a sheathing, a protecting cap and insulating material maintaining said sheathing and protecting cap out of contact.

18. A heat insulated vessel having an insulated corkage unit, said unit having a lower metal sheathing and an upper metal protecting cap, said sheathing and cap being out of metallic contact.

19. A heat insulated vessel having a removable corkage unit including a non-conducting substance and a sheathing, said sheathing having a flange embedded in a compressed portion of said non-conducting substance.

20. A heat insulated vessel having an insulated corkage unit, said unit having a sheathing secured in a compressed portion of said non-conducting subetance, a protecting cap having a flange encircling said non-conducting substance, and a flanged ring secured to said flange for retaining said non-conducting substance under compression.

21. A heat insulated vessel having an insulated corkage unit, said unit having a sheathing secured in a compressed portion of said non-conducting substance, a protecting cap having a flange encircling said non-conducting substance, a flanged ring secured to said flange for retaining said non-conducting substance under compression, and heat insulating material disposed within said flanged ring.

22. A heat insulated vessel having a removable corkage unit including a non-conducting body having parts thereof enveloped by sheet metal, a portion of said body being circumferentially disposed to contact with the mouth of the insulated vessel.

23. An insulated receptacle comprising an outer protective jacket and a removable insulating unit, said unit including a jacket and a container, said jacket and container being united at their upper end by a shock-insulating diaphragm.

24. An insulated receptacle, including an

disposed between said container
said inner jacket, said container, said
jacket and said diaphragm being re-
ble as a unit from the outer jacket.

A receptacle, including an outer jacket,
nner frangible container, a collar se-
d to said container, a shock insulating
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r jacket secured to said diaphragm,
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said outer jacket.

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rcing band encircling said outer jacket.

A receptacle including an outer pro-
ve jacket, an inner jacket, a container
shock insulating means, the inner jacket,
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A heat insulated receptacle including
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nal to the container and inner jacket
uniting the inner jacket and the con-
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A receptacle including an outer jacket
sing a removable unitary shock insu-
frangible container.

A heat insulated receptacle including
uter jacket inclosing a removable uni-
shock insulated frangible container.

An insulated receptacle comprising an
protective jacket and a removable in-
ing unit, said unit including a jacket
a container, said jacket and container
united at their upper ends by a shock
ating diaphragm closing the space be-
n them.

An insulated receptacle comprising
uter protective jacket and a removable
ating unit, said unit including a jacket
a container, said jacket and container
united by a shock-insulating dia-
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the jacket containing heat insulating
rial.

An insulated receptacle comprising an
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container, said jacket and container
united by a shock insulating dia-
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15. A receptacle including a protective jacket, a removable inner jacket, insulating material within said inner jacket, a container resting against said insulating material, and shock-insulating means for holding said insulating material within the space between the inner jacket and the container.

16. A receptacle including a protective jacket, and a composite insulating unit comprising an inner jacket and a frangible container flexibly united to each other.

17. A heat insulated vessel having an insulated corkage unit, said unit having a sheathing, a protecting cap and insulating material maintaining said sheathing and protecting cap out of contact.

18. A heat insulated vessel having an insulated corkage unit, said unit having a lower metal sheathing and an upper metal protecting cap, said sheathing and cap being out of metallic contact.

19. A heat insulated vessel having a removable corkage unit including a non-conducting substance and a sheathing, said sheathing having a flange embedded in a compressed portion of said non-conducting substance.

20. A heat insulated vessel having an insulated corkage unit, said unit having a sheathing secured in a compressed portion of said non-conducting substance, a protecting cap having a flange encircling said non-conducting substance, and a flanged ring secured to said flange for retaining said non-conducting substance under compression.

21. A heat insulated vessel having an insulated corkage unit, said unit having a sheathing secured in a compressed portion of said non-conducting substance, a protecting cap having a flange encircling said non-conducting substance, a flanged ring secured to said flange for retaining said non-conducting substance under compression, and heat insulating material disposed within said flanged ring.

22. A heat insulated vessel having a removable corkage unit including a non-conducting body having parts thereof enveloped by sheet metal, a portion of said body being circumferentially disposed to contact with the mouth of the insulated vessel.

23. An insulated receptacle comprising an outer protective jacket and a removable insulating unit, said unit including a jacket and a container, said jacket and container being united at their upper end by a shock-insulating diaphragm.

24. An insulated receptacle, including an outer protecting jacket, a removable shock insulated unit, said unit including a jacket,

a frangible container, shock insulating means at the upper end of the container uniting said jacket and container, the space between said container and jacket containing shock insulating material.

25. An insulated receptacle, including an outer protecting jacket, an inner jacket and a frangible container removable with the inner jacket, shock insulating means for uniting the inner jacket to the container at its upper end and means for locking the combined inner jacket and container within the outer protective jacket.

26. A removable insulating unit adapted to fit within an outer protecting jacket, unit including a jacket, a frangible tainer, flexible shock insulating mea the upper end of the jacket uniting jacket and container, and shock insul material surrounding the container.

In testimony whereof we affix our natures.

CORTLAND W. DAVI
FRANK R. SUNDERL

Witnesses:
L. V. D. BLAIR,
H. E. MALÉ.

UNITED STATES PATENT OFFICE.

WILLIAM B. ROOD AND ERNEST S. JOHNSON, OF WEBSTER CITY, IOWA.

HEAT-INSULATED CONTAINER.

362,740. Specification of Letters Patent. Patented Dec. 21, 1920.

Application filed March 15, 1919. Serial No. 282,943.

all whom it may concern:

e it known that we, WILLIAM B. ROOD ERNEST S. JOHNSON, citizens of the ted States of America, and residents of bster City, Hamilton county, Iowa, have ented certain new and useful Improve- ts in Heat-Insulated Containers, of ch the following is a specification.

ur invention relates to improvements in -insulated containers, and the object of improvement is to supply a compact, able and convenient device of this type, pensive in construction, easily disassem- for replacements or repairs, and other- most suitable in its construction for aining and keeping liquids or food for nsiderable time at a desired temperature. his object we have accomplished by the ns which are hereinafter described and ned, and which are illustrated in the ac- panying drawings, in which Figure 1 vertical medial cross section of our im- ed device, and Fig. 2 is an enlarged de- elevation of one of the releasable fasten- means used to connect detachably to- er parts or sections of the outer con- er.

milar numerals of reference denote cor- nding parts throughout the several s.

ferring to Fig. 1, B is a receptacle hav- contracted open neck, the latter sup- with a stopper D. A is a sectional iner mounted about and spaced away the receptacle B. E denotes one kind astic porous or chambered packing fill- he interspace of the receptacle B and iner A. C is a cup inverted and fitted the diminished upper part of the con- r A and covering the exposed top of the of the receptacle B with its stopper D. r convenience in manufacture, assem- and disassembling, the outer receptacle made in detachably connected sections nd 7. The section 1 is a hollow drum lindrical form provided near the op- ends with stiffening beads 2 extend- utwardly and also serving as stops for verlapping parts of the top and bottom ns 4 and 7.

bottom section 7 is dished, while the tion 4 is conical, with a relatively having a short conical otherwise shaped to properly conform to the shape of the receptacle B and its neck. Said sections may be fastened together detachably while leaving the container as a whole imperforate, by any convenient or desirable means, but we have shown in Fig. 2 an instance for the purpose of illustration. The numeral 5 denotes an angular notch or recess in an edge part of either section 4 or 7, receiving a headed stud 3 fixed on the margin of the abutting part of the drum 1, the stud being received and interlocked with the walls of said recess when said parts are overlapped and relatively rotated. This bayonet-joint fastening means is convenient, enabling the parts to be easily assembled or disassembled.

The interspace of the receptacle B and its container A may be filled with a suitable flexible or elastic cushioning and porous material, preferably a non-conductor of heat. We have found that corrugated straw-board E is very suitable for the purpose, possessing the desired qualities mentioned and having between the corrugations relatively small interspaces which are in effect dead air spaces, homogeneously distributed and a good non-conductor of heat. The corrugated pieces are in superposed strips, each strip carrying a thin covering of paper on one or both faces which keeps the strips in parallel relation without nesting. For convenience, in the sectional type of container A, above referred to, the pieces or strips of material E are properly cut, mounted and fitted within the respective sections of the container, as shown, or otherwise to prepare the device for being disassembled with a minimum of trouble.

This kind of packing is very light and elastic, and cushions well against shocks from any direction, without settling or varying in homogeneity, and renders the device especially useful for carriage on vehicles where subjected to many shocks, or for employment by farmers, mechanics, miners and others, the container A being provided with a suitable handle.

In case the receptacle B, if made of breakable material, is broken, the container sections may be readily disassembled to receive another.

Variations in the details of construction

UNITED STATES PATENT OFFICE.

HERBERT M. SMITH, OF GREAT BARRINGTON, MASSACHUSETTS, ASSIGNOR TO STANLEY INSULATING COMPANY, OF GREAT BARRINGTON, MASSACHUSETTS, A CORPORATION OF MAINE.

HEAT-INSULATED RECEPTACLE.

Application filed September 30, 1918. Serial No. 256,285.

ll whom it may concern:

it known that I, HERBERT MILIS , a citizen of the United States, resid- t Great Barrington, in the county of shire and State of Massachusetts, have ted certain new and useful Improve- s in Heat-Insulated Receptacles, of h the following is a specification.

is invention relates to heat-insulated tacles of the general character shown United States patent to William Stan- o. 1,071,817, and particularly to an em- ment of the same in the form of a con- r for food or the like which is to be ded with means for carrying it on the n.

e of the objects of the invention is to de a device of this character which be readily assembled and disconnected an outside casing when desired.

other object is to provide an improved of stopper or closure for a receptacle s kind as well as convenient means for g the stopper in closing position and ut affecting its ready removal.

er objects of the invention, more or road than those stated above, together the advantages inherent, will appear the following description of the ele- , combinations, arrangements of parts pplications of principles constituting vention; and the scope of protection mplated will appear from the claims. he accompanying drawings which are aken as a part of this specification and ich I have shown a merely preferred of embodiment of the invention. Fig- is a central vertical cross sectional view evice embodying the invention; Figure top plan view of the same; Figure 3 ragmentary view similar to Figure 1 lustrating a modification; Figure 4 is ional view showing in enlarged detail of the parts of Figure 3.

erring to the numerals on the draw- here is shown at 5 the inner container eat-insulated receptacle, of which 6 is rrounding outer shell, the inner con- 5 and the shell 6 being spaced apart e space 7 constituting the vacuous hich is to be filled with finely divided ing material. The shells 5 and 6 are ted together as by welding at the neck of the complete receptacle, this joint being indicated at 8, and the bottom closure comprises a plate 9 having adjacent its edges a bent spring portion 10 and a downwardly turned flange 11. After the vacuous space 7 has been filled with compressed finely divided insulating material in the manner stated in a co-pending application of mine, the closure member 9 is inserted inside the lower end of the outer shell 6, as illustrated in Figure 1. Because of its shape, this bottom plate 9 is readily introduced into position and pushed forward up against the insulating material, but does not readily move backwardly. Preferably centrally this plate 9 is provided with a dished portion 12, perforated as at 14. In this dished portion 12 I place a quantity of steel wool or the like, for a purpose hereinafter explained. The plate 9 being in position a second plate 15 having an annular flange 16 is inserted, and this flange 16 is welded to the adjacent wall of the outer shell 6. The purpose of using the first bottom plate 9 is to hold the insulating material in place, and the flange 11 serves to prevent the dropping down of particles of insulating material which might interfere with the operation of welding the flange 16 of the lower bottom plate. After the bottom plate 9 is in position the surface of the shell 6 below the flange 11 is cleaned to make ready for the welding to it of the flanged part 16 of the second bottom plate 15. The second bottom plate 15 is provided with a dished portion 17 centrally arranged and corresponding to the dished portion 12 of the first bottom plate, and opening into this dished portion 17 there is a tube 18 for connection to a vacuum pump whereby a partial vacuum is created in the insulating material which fills the vacuous space 7, between and around the particles thereof. The mass of steel wool 14, while permitting the removal of air from the vacuous space, prevents the disturbance of the insulating material itself and its removal through the pump.

The heat-insulated receptacle thus described is adapted to be upwardly inserted into an outside casing which is indicated by the reference character 20. This may have any desired shape in cross section, and in the drawings it is shown as square, the outer

UNITED STATES PATENT OFFICE.

WILLIAM B. ROOD AND ERNEST S. JOHNSON, OF WEBSTER CITY, IOWA.

HEAT-INSULATED CONTAINER.

Specification of Letters Patent. Patented Dec. 21, 1920.

1,362,740.

Application filed March 15, 1919. Serial No. 283,943.

all whom it may concern:

Be it known that we, WILLIAM B. ROOD and ERNEST S. JOHNSON, citizens of the ited States of America, and residents of bster City, Hamilton county, Iowa, have ented certain new and useful Improve- ts in Heat-Insulated Containers, of ch the following is a specification.

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This kind of packing is very light and elastic, and cushions well against shocks from any direction, without settling or varying in homogeneity, and renders the device especially useful for carriage on vehicles where subjected to many shocks, or for employment by farmers, mechanics, miners and others, the container A being provided with a suitable handle.

In case the receptacle B, if made of breakable material, is broken, the container sections may be readily disassembled to receive another.

Variations in the details of construction of the device will be within the principles of the invention.

entors, ood, and son, by Kennedy & Orney.

Having described our invention, what we claim as new, and desire to secure by Letters Patent, is:

A sectional container for a frangible vessel, comprising an orificed hollow top member, a cupped bottom member, and a hollow intermediate drum, the drum having outwardly-directed circumferential beads spaced from its upper and lower edges and having outwardly projecting headed pins on its outer wall between its end edges and said beads, the said top and bottom members overlapping the ends of the drum and having angular bayonet-slot connections in their edges to releasably receive and lock with said headed pins, and flexible silient packing elements positioned rately and independently within sa and bottom members and said dru space and cushion a frangible con vessel therein and therefrom, permitti sembling and disassembling of said tainer parts without displacement of packing elements.

Signed at Webster City, Iowa, this day of February, 1919.

WILLIAM B. ROOD.
ERNEST S. JOHNSO

W. B. ROOD AND E. S. JOHNSON.

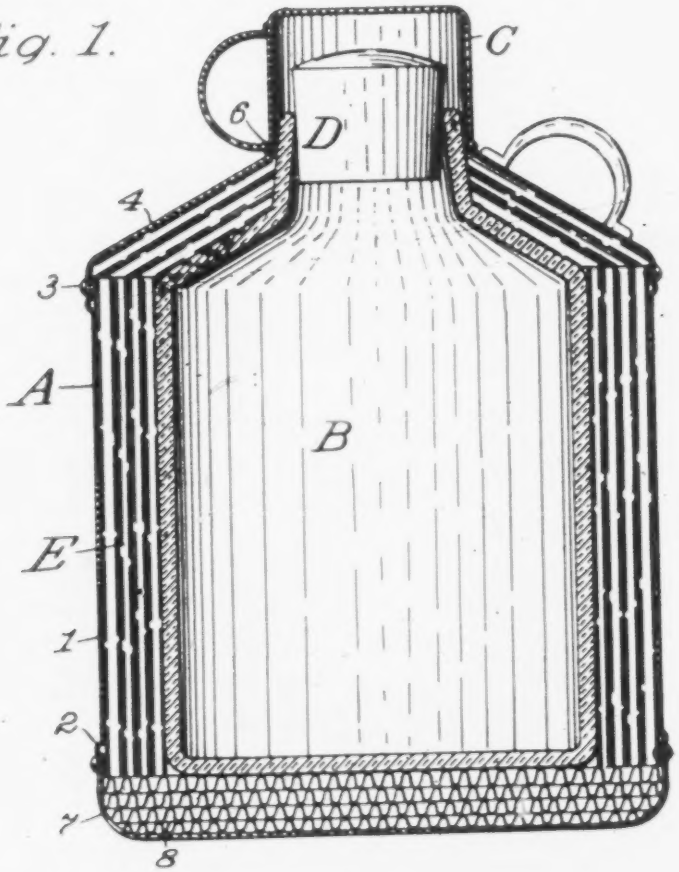
HEAT INSULATED CONTAINER.

APPLICATION FILED MAR 15, 1919.

1,362,740.

Patented Dec. 21, 192

Fig. 1.



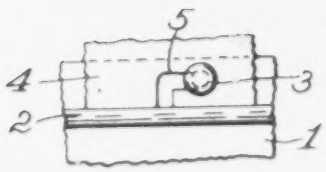


Fig. 2.

Inventors
William B. Rood, and
Ernest S. Johnson, by
G. G. Kennet
Attorney.

430

H. M. SMITH.

HEAT INSULATED RECEPTACLE.

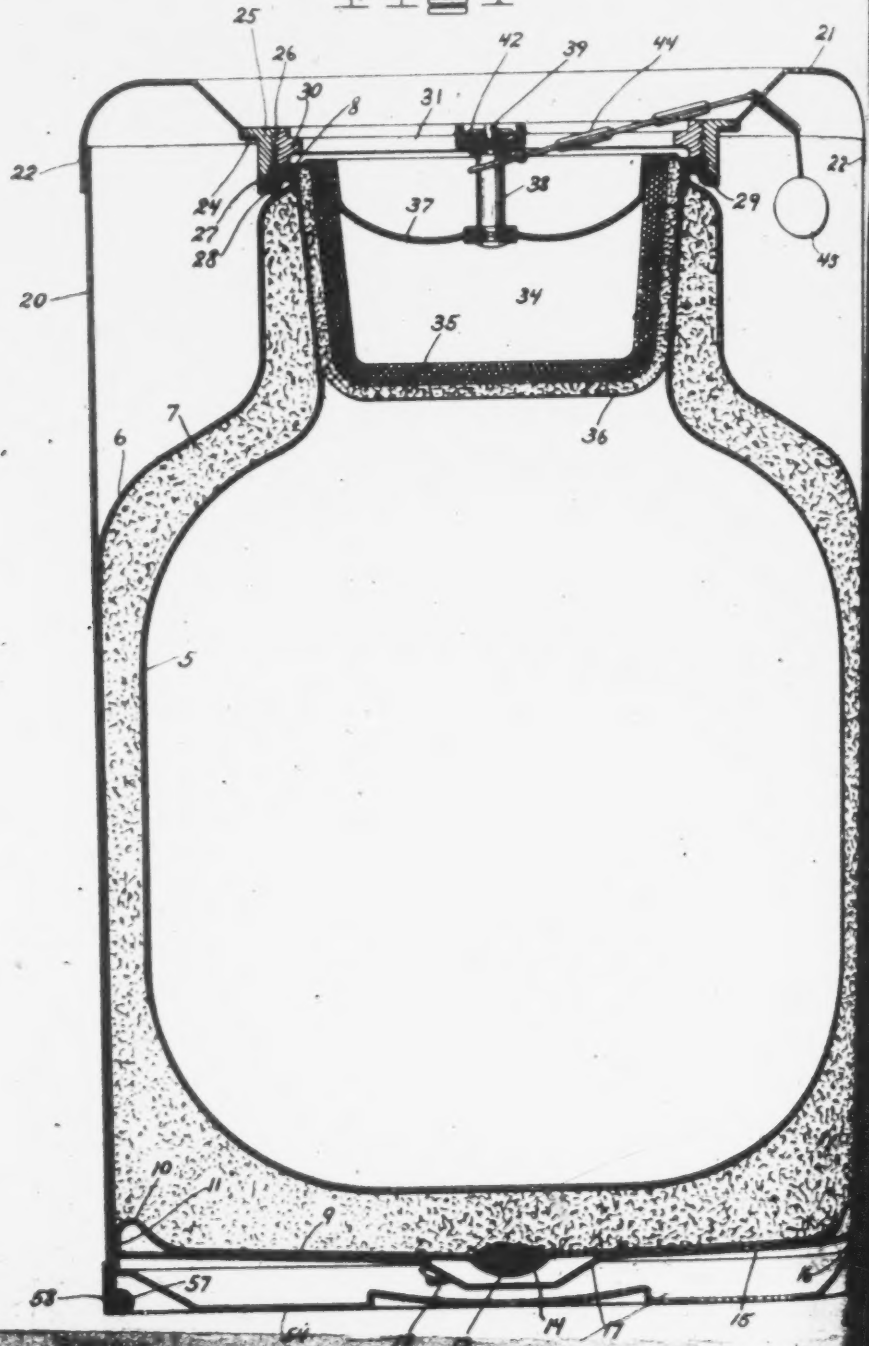
APPLICATION FILED SEPT. 30, 1913.

1,431,189.

Patented Oct. 10, 1922.

2 SHEETS—SHEET 1.

Fig. 1



INVENTOR
Herbert M. Smith
BY
Frank J. Kent
ATTORNEY

H. M. SMITH.

HEAT INSULATED RECEPTACLE.

APPLICATION FILED SEPT. 30, 1918.

1,431,189.

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2 SHEETS—SHEET

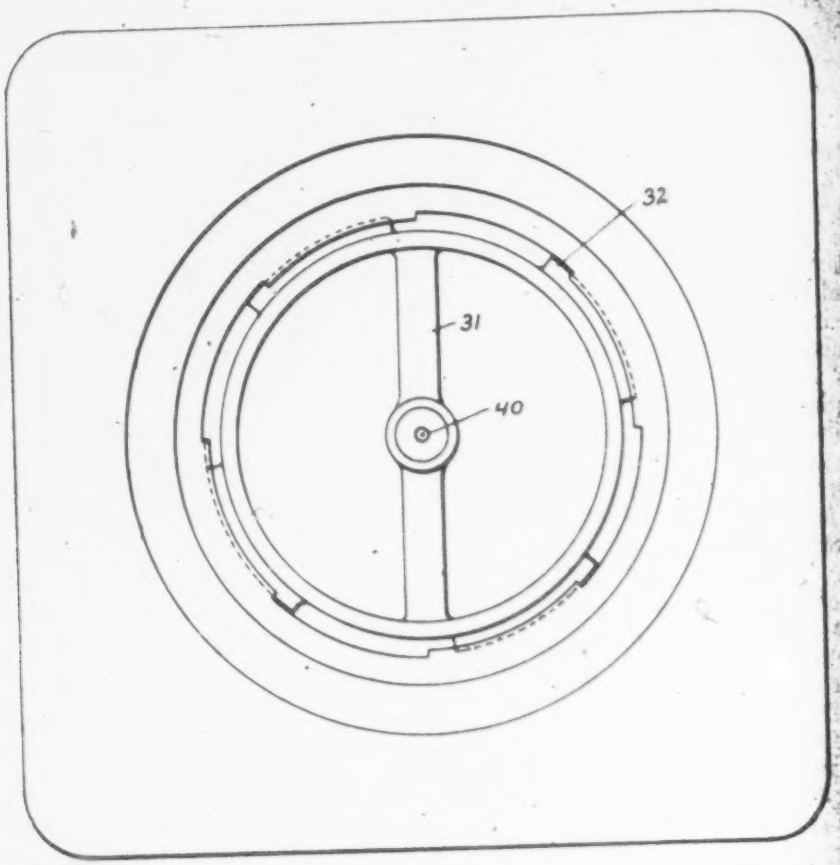


Fig 2

Fig 3

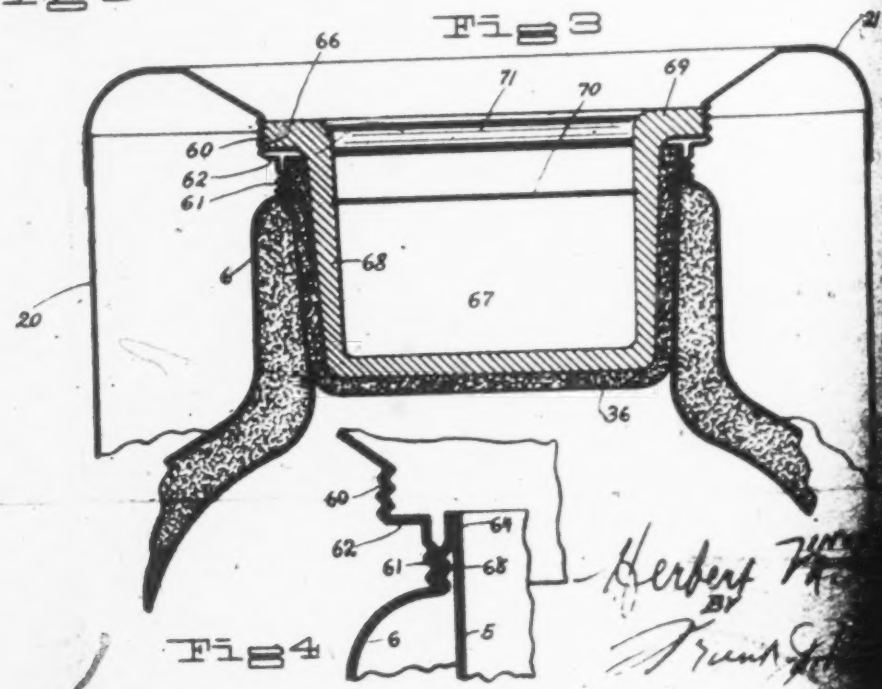


Fig 4

Herbert M. Smith

By

Frank S.

ented Oct. 10, 1922. 1,431,189

UNITED STATES PATENT OFFICE.

HERBERT M. SMITH, OF GREAT BARRINGTON, MASSACHUSETTS, ASSIGNOR TO STANLEY INSULATING COMPANY, OF GREAT BARRINGTON, MASSACHUSETTS, A CORPORATION OF MAINE.

HEAT-INSULATED RECEPTACLE.

Application filed September 30, 1918. Serial No. 256,285.

all whom it may concern:

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neck of the complete receptacle, this joint being indicated at 8, and the bottom closure comprises a plate 9 having adjacent its edges a bent spring portion 10 and a downwardly turned flange 11. After the vacuous space 7 has been filled with compressed finely divided insulating material in the manner stated in a co-pending application of mine, the closure member 9 is inserted inside the lower end of the outer shell 6, as illustrated in Figure 1. Because of its shape, this bottom plate 9 is readily introduced into position and pushed forward up against the insulating material, but does not readily move backwardly. Preferably centrally this plate 9 is provided with a dished portion 12, perforated as at 14. In this dished portion 12 I place a quantity of steel wool or the like, for a purpose hereinafter explained. The plate 9 being in position a second plate 15 having an annular flange 16 is inserted, and this flange 16 is welded to the adjacent wall of the outer shell 6. The purpose of using the first bottom plate 9 is to hold the insulating material in place, and the flange 11 serves to prevent the dropping down of particles of insulating material which might interfere with the operation of welding the flange 16 of the lower bottom plate. After the bottom plate 9 is in position the surface of the shell 6 below the flange 11 is cleaned to make ready for the welding to it of the flanged part 16 of the second bottom plate 15. The second bottom plate 15 is provided with a dished portion 17 centrally arranged and corresponding to the dished portion 12 of the first bottom plate, and opening into this dished portion 17 there is a tube 18 for connection to a vacuum pump whereby a partial vacuum is created in the insulating material which fills the vacuous space 7, between and around the particles thereof. The mass of steel wool 14, while permitting the removal of air from the vacuous space, prevents the disturbance of the insulating material itself and its removal through the pump.

The heat-insulated receptacle thus described is adapted to be upwardly inserted into an outside casing which is indicated by the reference character 20. This may have any desired shape in cross section, and in the

surface of the body portion of the shell 6 being substantially tangent to the walls of the casing 20. This casing 20 comprises a body portion or shell with a top 21 connected to it as by welding along the line 22. This top is provided with a central opening, defined by a shouldered part 24, in which is seated and held as by welding a ring 25 provided with a thread 26 and with an offset threaded portion 27 of larger diameter than the threaded portion 26. The threaded portion 27 is for engagement with the corresponding threads of a ring member 28 which is welded at the end of the shell 6, where the latter is welded to the end of the shell 5. The result of this construction is that the receptacle comprising the shells 5 and 6 may be inserted through the open bottom of the casing 20 and the ring 28 screwed into the threaded section 27 of the ring 25 until the flange 29 of the ring 28 contacts with the lower edge of the ring 25. The threaded section 26 of the ring 25 is for engagement with the correspondingly threaded periphery of a bridge lock ring 30, having an operating bar 31 and having also mutilated thread sections 32 cooperating with corresponding mutilated sections of the thread portion 26 of ring 25. This familiar construction need not be further described, except to say that it enables the operator to lock two threaded parts together or unlock them with a partial rotation of one of the threaded members. This bridge lock ring 30 is for the control of a stopper member indicated generally at 34 in Figure 1. This stopper member may be made hollow as shown with a number of laminæ of fibre or fabric of good heat-insulating quality indicated by the reference character 35 with an outer coating or covering 36 of vulcanized rubber or other material having good heat-insulating qualities and adapted to make a good liquid-tight joint. As shown, the stopper 34 is conical and the wall of the inner container 5 into which it fits is correspondingly inclined so that the further the stopper is driven in the better the seal. The stopper is completed by a cover 37 at the top which is bent as shown to give it additional resiliency, and from the centre of this spring cover 37 extends a post 38 at the top of which is a reduced pin 39 which passes through the centre 40 of the bridge lock bar 31 and is held in position by means of a cross pin 42 which passes through the end of the pin above the bar 31. The result of this construction is that the stopper member 34 may be rotated relatively to the bridge lock ring 30, but as the bridge lock ring moves up or down relatively to the ring 25, the stopper must move with it. In order to prevent accidental loss of the stopper in use, I may provide a

and having its other end suitably
to the casing 20 as indicated by the
45. I regard the provision of the
cover 37 as of considerable import
cause it gives the stopper a spring
fit in the mouth of the bottle or re

The bottom of the complete recep
preferably constituted by a bottom
54 which may be soldered in position
the lower end of the casing 20, the ca
extending for that purpose somewhat
the end of the heat-insulated receptacle
in it, and this bottom member 54 may
downwardly extending flange 55 w
it is soldered to the surrounding wall
casing 20 and may be upset to form a
56 in which lies a reinforcing wire 57.
desired an additional outside finishing
strengthening ring 58 may also be pro

In Figures 3 and 4 I have illustr
modified form of connection betwe
heat-insulated receptacle and the ca
and have dispensed with the sep
formed rings 25 and 28. To this end
plate 21 of the casing 20 surround
central opening thereof is formed w
parallel but offset threaded portion
cated respectively at 60 and 61, the
portion 60 being of larger diameter
threaded portion 61, and the two be
arated by a shoulder 62. These
portions are formed in the metal by
able die or otherwise. In this inst
upper end of the neck portion of the
just below where it is welded to the
at the point 64, is also provided
threaded portion 65 impressed in
by means of dies or the like. This
portion 65 is to engage with the
portion 61 of the top piece 21,
threaded portion 60 of the top
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per 67. In this instance the stop
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In the form of device sho
the heat-insulated receptacle i
the bottom of the casing as in
and the threaded end 65 of

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bar 71 will also preferably b
the same purpose as the b
shown in Figures 1 and 2.

In the form of device sho
the heat-insulated receptacle i
the bottom of the casing as in
and the threaded end 65 of

red into the threaded section 61 of the piece until the outer end of the threaded on 61 rests against the outwardly flaring on of the shell 6. The several rings 25 28 are dispensed with and consequently number of parts and difficulty of assem- are very much reduced. Likewise, the per construction which is shown in Fig- 3, is somewhat simpler because the means controlling the stopper is integral with stopper instead of being a separate part n Figure 1.

will be evident that other departures be made from the specific embodiments y invention shown in the drawings with- departing from the scope of the protec- which I have marked out in the append- laims.

claim:

A device of the kind described compris- an outer casing having a central aper- in its top defined by a depending por- provided with two sets of threads on erent diameters respectively, and an n-mouthed receptacle within the casing ing its mouth portion in threaded en- ement with one of the threaded portions esaid of the casing, and a stopper for mouth of the receptacle having threaded gement with the other of the threaded ions of the casing aforesaid.

A device of the kind described compris- a casing provided with a central aper- in its top defined by a depending por- of the casing having two sets of threads ed on different diameters in the mate- of the casing and an open-mouthed re- acle within the casing having its mouth ion in threaded engagement with the rmost one of the sets of threads of the g. aforesaid, and having a shoulder ting against the lower edge of said ded part of the casing.

A device of the kind described compris- a casing provided with a central aper- in its top defined by a depending por- of the casing having two sets of threads ed on different diameters in the mate- of the casing and an open-mouthed re- acle within the casing having its mouth on in threaded engagement with the rmost one of the sets of threads of the g. aforesaid, and having a shoulder ing against the lower edge of said ded part of the casing, and a stopper the mouth of the receptacle having ded engagement with the other thread- rtion of the casing aforesaid.

A device of the kind described compris- n outer casing having an aperture in pper end, an open-mouthed receptacle ged within the casing with its opening try with the aperture in the casing, a mouth of the receptacle, and and engageable with the stopper for holding the said stopper within the mouth of the receptacle.

5. A device of the kind described comprising an outer casing having an aperture in its upper end, an open-mouthed receptacle arranged within the casing with its opening in registry with the aperture in the casing, a stopper for the mouth of the receptacle, and means secured within the casing aperture and peripherally engaging the stopper for maintaining the latter pressed within the mouth of the receptacle.

6. A device of the kind described comprising an outer casing having an aperture in its upper end, an open-mouthed receptacle arranged within the casing with its opening in registry with the aperture in the casing, a stopper for the mouth of the receptacle, and means secured within the casing aperture and having a yieldable member associated therewith, said member arranged for engagement with the stopper whereby said stopper is resiliently pressed within the mouth of the receptacle.

7. A receptacle having a mouth with tapered inner walls and a cup-shaped stopper for the mouth of the receptacle, a bridge lock, and means interposed between the bridge lock and the stopper peripherally engaging the latter for maintaining the stopper resiliently pressed in the mouth.

8. A receptacle having a mouth with tapered inner walls and a cup-shaped stopper for the mouth of the receptacle, a bridge lock, and a resilient means interposed between the bridge lock and the stopper peripherally engaging the upper edge of the latter for maintaining the stopper resiliently pressed in the mouth.

9. A receptacle of the kind described comprising an inner container and an outer shell, the outer shell extending below the inner container, a flanged bottom piece fitting within the outer shell below the inner container, and a second bottom piece within the outer shell below the first bottom piece against which the flange of the first bottom piece is adapted to rest.

10. A receptacle of the kind described comprising an inner container and an outer shell, the outer shell extending below the inner container, a bottom piece loosely fitting within the outer shell below the inner container and a second bottom piece rigidly secured within the outer shell and against which the first mentioned bottom piece is adapted to rest.

11. A receptacle of the kind described comprising an inner container and an outer shell, the outer shell extending below the inner container, a flanged bottom piece fitting within the outer shell below the inner container, and a second flanged bottom

the outer end of the threaded
n 61 rests against the outwardly flaring
n of the shell 6. The several rings 25
28 are dispensed with and consequently
umber of parts and difficulty of assem-
re very much reduced. Likewise, the
er construction which is shown in Fig-
, is somewhat simpler because the means
ontrolling the stopper is integral with
topper instead of being a separate part
Figure 1.

will be evident that other departures
be made from the specific embodiments
y invention shown in the drawings with-
departing from the scope of the protec-
which I have marked out in the append-
laims.

claim:

A device of the kind described compris-
an outer casing having a central aper-
in its top defined by a depending por-
provided with two sets of threads on
rent diameters respectively, and an
-mouthed receptacle within the casing
ing its mouth portion in threaded en-
ement with one of the threaded portions
said of the casing, and a stopper for
mouth of the receptacle having threaded
gement with the other of the threaded
ions of the casing aforesaid.

A device of the kind described compris-
a casing provided with a central aper-
in its top defined by a depending por-
of the casing having two sets of threads
ed on different diameters in the mate-
of the casing and an open-mouthed re-
acle within the casing having its mouth
ion in threaded engagement with the
rmost one of the sets of threads of the
g. aforesaid, and having a shoulder
ting against the lower edge of said
ded part of the casing.

A device of the kind described compris-
a casing provided with a central aper-
in its top defined by a depending por-
of the casing having two sets of threads
ed on different diameters in the mate-
of the casing and an open-mouthed re-
cle within the casing having its mouth
on in threaded engagement with the
most one of the sets of threads of the
g. aforesaid, and having a shoulder
ing against the lower edge of said
ded part of the casing, and a stopper
he mouth of the receptacle having
ded engagement with the other thread-
rtion of the casing aforesaid.

A device of the kind described compris-
n outer casing having an aperture in
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ged within the casing with its opening
istry with the aperture in the casing, a
er for the mouth of the receptacle, and
s secured within the casing aperture
the said stopper within the mouth of the receptacle.

5. A device of the kind described comprising an outer casing having an aperture in its upper end, an open-mouthed receptacle arranged within the casing with its opening in registry with the aperture in the casing, a stopper for the mouth of the receptacle, and means secured within the casing aperture and peripherally engaging the stopper for maintaining the latter pressed within the mouth of the receptacle.

6. A device of the kind described comprising an outer casing having an aperture in its upper end, an open-mouthed receptacle arranged within the casing with its opening in registry with the aperture in the casing, a stopper for the mouth of the receptacle, and means secured within the casing aperture and having a yieldable member associated therewith, said member arranged for engagement with the stopper whereby said stopper is resiliently pressed within the mouth of the receptacle.

7. A receptacle having a mouth with tapered inner walls and a cup-shaped stopper for the mouth of the receptacle, a bridge lock, and means interposed between the bridge lock and the stopper peripherally engaging the latter for maintaining the stopper resiliently pressed in the mouth.

8. A receptacle having a mouth with tapered inner walls and a cup-shaped stopper for the mouth of the receptacle, a bridge lock, and a resilient means interposed between the bridge lock and the stopper peripherally engaging the upper edge of the latter for maintaining the stopper resiliently pressed in the mouth.

9. A receptacle of the kind described comprising an inner container and an outer shell, the outer shell extending below the inner container, a flanged bottom piece fitting within the outer shell below the inner container, and a second bottom piece within the outer shell below the first bottom piece against which the flange of the first bottom piece is adapted to rest.

10. A receptacle of the kind described comprising an inner container and an outer shell, the outer shell extending below the inner container, a bottom piece loosely fitting within the outer shell below the inner container and a second bottom piece rigidly secured within the outer shell and against which the first mentioned bottom piece is adapted to rest.

11. A receptacle of the kind described comprising an inner container and an outer shell, the outer shell extending below the inner container, a flanged bottom piece fitting within the outer shell below the inner container, and a second flanged bottom piece secured within the outer shell for

maintaining the first mentioned bottom piece in position.

12. A device of the kind described comprising an outer casing having an aperture in its top defined by a depending portion provided with two sets of threads, an open-mouthed receptacle within the casing having its mouth portion in threaded engagement with one of the threaded portions aforesaid of the casing, and a stopper for the mouth of the receptacle having threaded engagement with the other of the threaded portions of the casing.

13. A device of the kind described comprising an outer casing having an aperture in its top defined by a depending portion provided with two sets of threads on different diameters, an open-mouthed receptacle within the casing having its mouth portion in threaded engagement with the larger diametered set of threads and a stopper for the mouth of the receptacle having threaded engagement with the other set of threads.

In testimony whereof I affix my signature

HERBERT M. SMITH

438

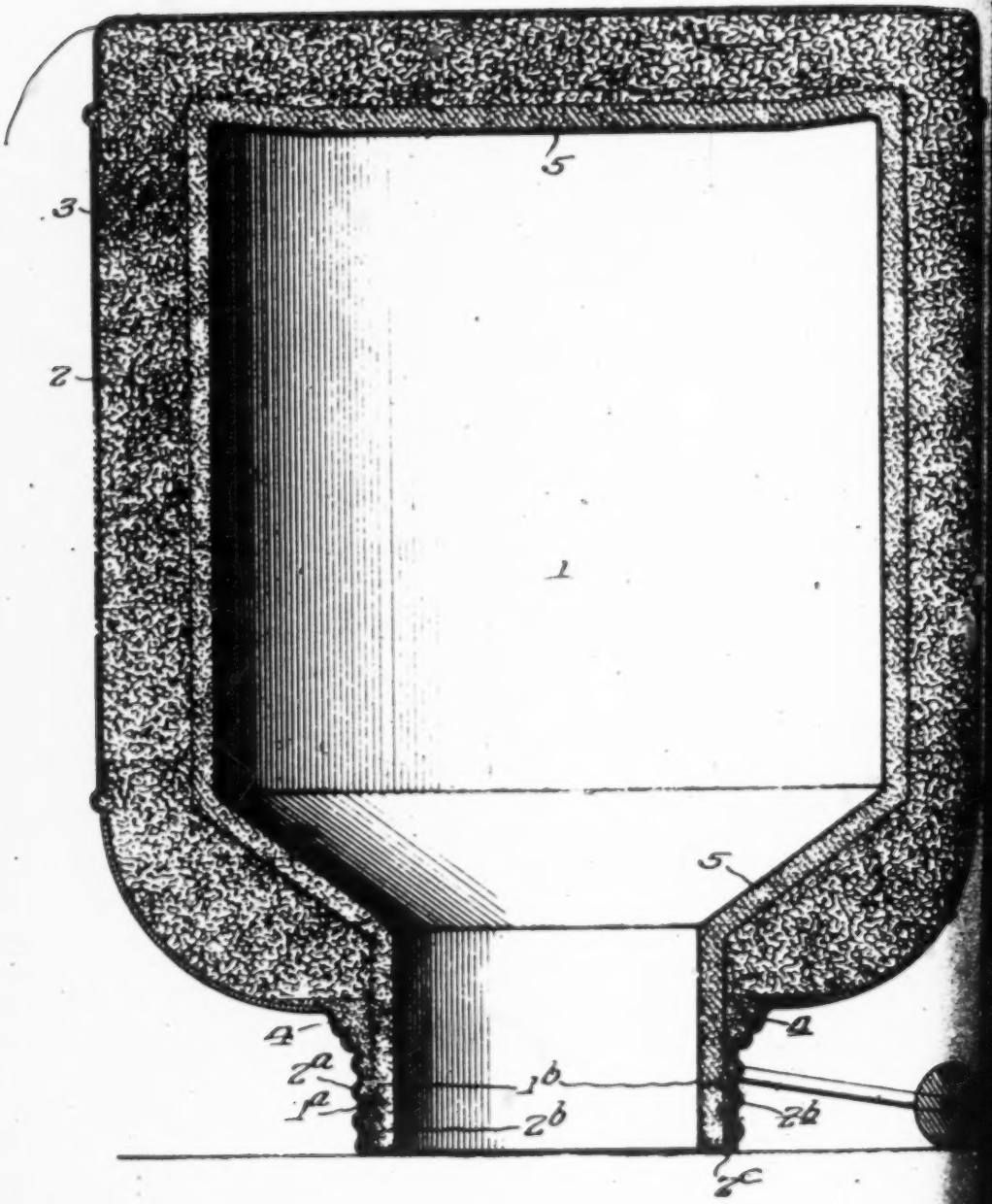
Dec. 11, 1923.

1,477,101

P. H. BRAINARD

HEAT INSULATED CONTAINER

Filed Jan. 25, 1923



Witness:

Inve
Pearl H. Brain
Kilgannon, Morsey &

Patented Dec. 11, 1923. 1,477,101

UNITED STATES PATENT OFFICE.

PEARL H. BRAINARD, OF MACOMB, ILLINOIS.

HEAT-INSULATED CONTAINER.

Application filed January 25, 1923. Serial No. 614,761.

To all whom it may concern:

Be it known that I, PEARL H. BRAINARD, a citizen of the United States, residing at Macomb, in the county of McDonough and State of Illinois, have invented certain new and useful Improvements in Heat-Insulated Containers, of which the following is a specification.

This invention relates to containers having walls contructed with special reference to resistance of heat conduction from the exterior to the interior of the container, or vice versa. The embodiment of the invention herein selected for purpose of illustration is designed particularly to serve as a portable container, but it is to be understood that the novel features of the invention are applicable to containers designed for a wide variety of other purposes, such, for instance, as stationary water coolers, refrigerators, incubators, and, in short, any container in which it is desirable to prevent the conduction of heat through the walls.

The invention has particular reference to containers, the walls of which comprise inner and outer shells positioned to leave a space between them which is especially treated to render it of low heat conductivity, preferably by filling it with a suitable material, such for instance, as ground cork, and particularly to a double wall container in which the inner shell constitutes a receptacle for goods to be protected.

One object of the present invention is to provide an inner shell or receptacle of a construction which will not only render it economical to produce but very durable in use, and particularly of a nature which adapts it to contribute largely to resistance of heat transmission. Accordingly, one feature of the invention consists in making the inner shell of the container of a highly porous non-vitreous clay of sufficient thickness to afford substantial resistance to heat conduction, as, for instance, by taking a quality of clay which is refractory rather than vitreous, molding therefrom a receptacle of desired size and form, and soft-burning the receptacle thus produced in order to leave it in a relatively light and porous physical condition, and with a thickness that affords a substantial resistance to heat conductivity. The receptacle is glazed on the interior to render it impervious, but left free from glazing on the exterior. I have found in practice that a receptacle or inner shell made of material of the kind stated and having a general thickness of one-quarter of an inch will answer well the purposes stated, and add greatly to the efficiency of a double walled container surrounded by known means of insulation, such, for instance, as a substantial layer of ground cork.

Another object of the invention is to provide a double walled container of the kind stated, in which an inner wall of earthy material is substantially and durably united with an outer shell of metal, spaced from the inner wall throughout their opposed areas including the restricted area of union. Accordingly, another feature of the invention consists in forming the inner and outer shells with restricted areas of substantially parallel and opposed surfaces, as, for instance, at limited annular portions of concentric necks formed on the two shells and with a substantial space between said faces, and filling such space with a cement having the characteristic of setting and becoming hard and solid so as to hold the one receptacle rigidly and immovably within the other; the material of the inner receptacle, and particularly the surface thereof which receives the cement, being of a highly porous earthy material with which the cement will enter into very strong adhesion; and both of the opposed surfaces to be united being preferably grooved in a manner to secure against displacement the body of cement which unites them.

The invention will be fully understood upon reference to the accompanying drawing, which shows in vertical longitudinal section, and in an inverted position, a water bottle embodying the several features of the invention.

1 represents the inner receptacle, 2 the outer receptacle, positioned one within the other with a substantial space between them,

and 3 represents a filling of ground cork or other material of low heat conductivity filling said space. The receptacles 1 and 2 are constructed, respectively, with necks 1^a, 2^a, located with a substantial space between them, and this space is filled with a body 4 of hard setting cement, the necks being provided, respectively, with grooves 1^b and 2^b to firmly key this body of cement between them. Preferably the neck 2^a will have an inturned flange 2^c for determining the axial relation between the inner and outer receptacles, and this, together with the necks 1^a and 2^a, constitutes a mold in which the uniting body 4 of cement can be conveniently and accurately cast when the assembled receptacles of the container are placed in inverted position, with the bottom section of the outer receptacle or shell omitted and before the insulating filler 3 is put in place.

The body 4 of cement is preferably built up to a level slightly above the shoulder of the outer shell or receptacle as shown, as this insures a solid body of cement and permits the cement to be introduced in a relatively slack condition in which it can flow intimately into all the spaces.

An important feature of the present invention resides in the relative thickness of the inner receptacle 1 and the material of which it is constructed. It is made of an earthy material of a character which retains a highly cellular or porous condition after it is hardened, with the result that it has inherently a very low coefficient of heat conductivity, and its thickness is such as to cause this attribute of the material to substantially increase the heat resistance of the whole structure. In practice, I have usually employed for this part of the construction a refractory and relatively non-vitreous clay, and have soft-burned the receptacle after it is shaped as distinguished from hard-burning it, namely, by controlling the kiln temperature to which it is submitted; and glazing is applied to but one side, namely, the inside, as shown at 5, the exterior surface being left free from surfacing material which might tend to raise the coefficient of conductivity.

The material of which the inner receptacle 1 is constructed is particularly advantageous in securing a solid and immovable union between the necks of the receptacles by the cement filler 4, as the cement adheres very much more intimately with the surface of the inner receptacle by reason of its non-glazed porous condition. The cement used for uniting the inner and outer shells is preferably a good grade of Portland cement, or equivalent material, with a sufficient proportion of plaster of Paris to neutralize any acid condition of the cement, or preferably hydrated lime in sufficient proportion for this purpose, or equivalent alkaline matter, as this will lend the additional advantage of rendering the cement union still less pervious to moisture.

While I have described in detail the preferred embodiment of the several features of my invention, I desire it understood that the terms of the appended claims rather than the detailed description are to be taken as defining the scope of the invention.

I claim:

1. A heat insulated container having walls constructed with spaced inner and outer shells, of which the inner shell is composed of highly porous substantially non-vitreous earthy material having a thickness which offers substantial resistance to passage of heat by conduction.

2. A heat insulated container having walls constructed with spaced inner and outer shells, of which the inner shell is composed of highly porous substantially non-vitreous earthy material having a thickness which offers substantial resistance to passage of heat by conduction; the exterior surface of said inner shell being free from glazing.

3. A heat insulated container having walls constructed with spaced inner and outer shells, of which the inner shell is composed of highly porous, refractory and non-vitreous earthy material having a thickness which offers substantial resistance to passage of heat by conduction.

4. A heat insulated container having walls constructed with spaced inner and outer shells, of which the inner shell is composed of highly porous soft-baked earthy material non-flowing under the heat of baking and having a thickness which offers substantial resistance to passage of heat by conduction.

5. A heat insulated container having walls constructed with spaced inner and outer shells, of which the inner shell is composed of highly porous substantially non-vitreous earthy material having a thickness which offers substantial resistance to passage of heat by conduction; said shells being rigidly united by a hard body of cement filling the space between restricted areas of opposed walls of said shells, and in adhesion to an unglazed surface of said inner shell.

6. A heat insulated container having walls constructed with spaced inner and outer receptacles, of which the inner receptacle is composed of highly porous earthy substantially non-vitreous material having a thickness which offers substantial resistance to passage of heat by conduction; said receptacles being constructed with overlapping necks and being rigidly united by a body of hard cement filling the space between their necks; the neck of the inner receptacle presenting to said cement an unglazed porous surface.

7. A heat insulated container having walls constructed with spaced inner and outer re-

ceptacles, of which the inner receptacle is composed of highly porous soft burned and substantially non-vitreous earthy material having a thickness which offers substantial resistance to passage of heat by conduction; said receptacles being constructed with overlapping necks and being rigidly united by a body of hard cement filling the space between their necks; the neck of the outer receptacle presenting a pervious non-glazed surface for adhesion of said cement.

Signed at Chicago, Illinois, this 19th day of January, 1923.

PEARL H. BRAINARD.

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April 1, 1924. 1,489,059

P. H. BRAINARD

JACKETED CONTAINER

Original Filed Dec. 29, 1921

Fig. 1

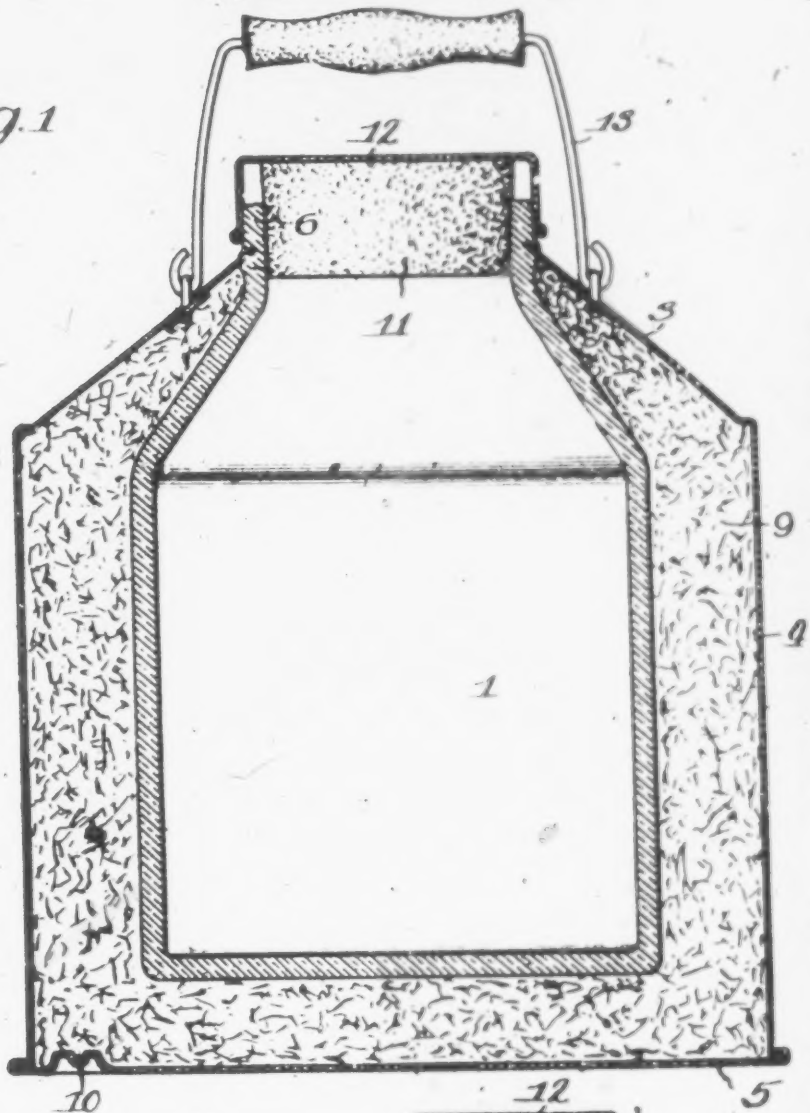


Fig. 3

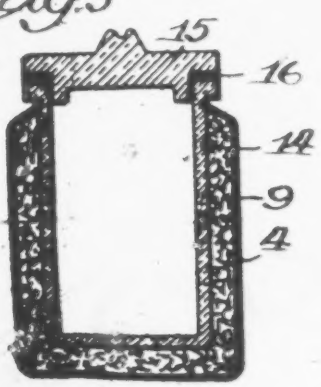
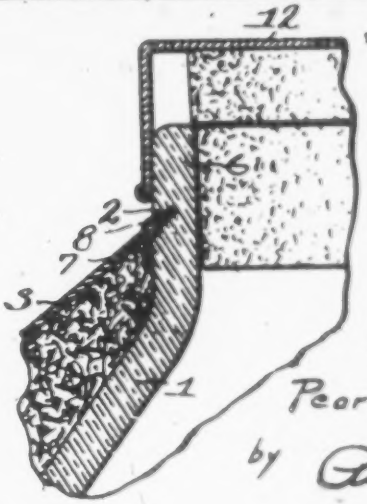


Fig. 2



Inventor:
Pearl H. Brainard
by Elliott Schlitt

Patented Apr. 1, 1924. 1,489,659

UNITED STATES PATENT OFFICE.

PEARL H. BRAINARD, OF MACOMB, ILLINOIS.

JACKETED CONTAINER.

Application filed December 29, 1921. Serial No. 535,784. Renewed January 8, 1924.

To all whom it may concern:

Be it known that I, PEARL H. BRAINARD, citizen of the United States, residing at Macomb, Illinois, have invented certain new and useful Improvements in a Jacketed Container; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to thermally insulated containers suitable for the storing of liquid or solid foods, or of other objects which are to be kept at a temperature differing from that of the surrounding air, its general objects being those of providing an unusually simple and inexpensive construction and one which will readily permit the interior of the container to be maintained in a highly sanitary condition. Furthermore, my invention aims to provide a construction which will readily permit the storage receptacle of the container to be made of pottery in the form of earthenware, porcelain or the like, so as to secure the advantages of the low thermal conductivity of such a material, combined with the strength and durability of the same and the ease with which its interior may be kept in a highly sanitary condition. Furthermore, my invention aims to provide unusually simple, inexpensive and effective means for securing the outer casing of a jacketed container to an inner receptacle of potteryware in such a manner as to afford adequate support for the latter and so as to afford a proper sealing of its juncture with the same. Still further and more detailed objects will appear from the following specification and from the accompanying drawings, in which—

Fig. 1 is a central and vertical section through a jacketed container embodying my invention.

Fig. 2 is an enlargement of a part of the mouth portion of the same, showing the arrangement of the supporting connection and of the seal between the container proper and the casing of the jacket.

Fig. 3 is a similar section through another embodiment of my invention, namely one in which the container proper has a cylindrical bore and in which its mouth is closed by a gasketed cap after the manner employed in fruit jars.

In the embodiment of Figs. 1 and 2, the receptacle portion (or container proper) of my invention consists of a jar 1, desirably made of earthenware or pottery having a wall of considerable thickness and glazed both on its inner and outer surfaces. Adjacent to its mouth, this receptacle 1 has a peripheral groove 2, which groove desirably slopes upward from the exterior of the receptacle and conforms substantially in its slope to the frusto-conical top 3 of the outer casing of the container. This outer casing is desirably made of metal with its main cylindrical wall portion 4 integral with the said tapering top portion 3, so as to avoid the necessity of sealing any joints between the two. However, the bottom 5 of the outer casing is desirably made of a separate piece and preferably is not only seamed over the lower edge of the side wall 4 into tight clinching relation to the latter, but also soldered or welded to the latter so as to afford an air-tight joint.

In assembling these main casing portions, the neck 6 of the earthenware or porcelain jar is slipped through the neck of the top 3 of the outer casing and this latter neck is then forcibly contracted into the groove 2, as by spinning the same into the said groove. Then the inserted portion of the top 3 is sealed into the groove by a filling 7 of a suitable air-tight cement introduced inside the metal casing and by a corresponding cement portion 8 applied from the outside of the latter. This cement is pressed into the groove so as to afford an air-tight joint between the casing portion 3 and the neck of the receptacle when the cement hardens.

After this has been done and before the bottom 5 is affixed to the casing, the said assembled portions are turned upside down and suitable steps are taken for reducing the conduction of heat between the receptacle and the outer casing. For this purpose, the intervening space is desirably filled with a suitable heat-insulating material 9 of thoroughly dried granulated cork or the like, after which the bottom 5 of the casing is attached to the side wall 4 and tightly sealed to the latter. If desired, air may be exhausted from the said space and from the pores of the cork or other filling also, by attaching a pump through an opening in the bottom 5, which opening is afterwards sealed as shown at 10 in Fig. 1. However, I have found in practice that even without produc-

ing a vacuum in the jacket of my device, I can obtain a heat-insulation which will retard the interchange of temperature between the exterior and interior of the receptacle sufficiently for ordinary commercial or household purposes. That is to say, the well known poor heat conductivity of the earthenware or porcelain cooperates with the means employed within the jacket (namely the cork filling, vacuum, or both thereof) in retarding such an interchange of heat. Consequently, I can maintain boiling water uncomfortably hot within the receptacle for ten or fifteen hours in cold weather, or can keep ice water with ice still floating in the same for a similar period on a hot summer day, and I can likewise keep ice-cream in proper condition for the same length of time.

Owing to the relatively small surface of the juncture between the metal casing and the inner receptacle, the direct heat conductivity from one to the other is kept quite low, and the interchange of heat at this point is desirably further retarded by employing a closure for the receptacle including a stopper 11 which extends below the groove 2 and which therefore prevents a conduction of heat along the shortest horizontal path from the neck of the metal top 3 of the outer casing to the bore of the neck 6 of the receptacle. If desired, this stopper may be covered by a suitable ornamental cap 12, and for most purposes I desirably equip the outer casing with a suitable handle 13 by which the entire appliance may be carried about.

However, I do not wish to be limited to these or other details of the construction and arrangement above described, nor to the particular shapes or uses heretofore mentioned, it being obvious that wide variations might be made without departing from the spirit of my invention or from the appended claims. For example, Fig. 3 shows an embodiment of the same in which the container 14 has an entirely cylindrical bore, thus facilitating the scooping of ice cream or the like from the same, and which has a glass cover 15 fitted with a rubber gasket 16 engaging the top of the mouth of the container. In other words, any desired form of inner containers may be advantageously employed, such as jars, jugs, carafes and the like, it being obviously unnecessary to illustrate them all.

I claim as my invention:

1. A jacketed container comprising a glazed jar or jug having a peripheral groove near its mouth, and a metal casing having its mouth portion sealed into the said groove, the casing being otherwise freely spaced from the jar or jug.

2. A jacketed container comprising an outer metal casing having a contracted upper end, a receptacle of pottery ware housed thereby and extending for a relatively short part of its length beyond the upper end of the metal casing, the receptacle and the casing having relatively interengaging formations for preventing movement of a receptacle with respect to the casing in all directions, the said formations supporting the receptacle within the casing in otherwise freely spaced disposition, and means for hermetically sealing the joint between the receptacle and the casing at their said interengaging formations.

3. A jacketed container comprising an earthenware jar or jug glazed on its interior, and a metal casing having its mouth contracted into embracing relation to the said jar or jug and sealed thereto, the metal casing being otherwise freely spaced from the jar or jug.

4. A jacketed container comprising an earthenware jar or jug glazed on its interior, and a metal casing having its mouth contracted into embracing relation to the said jar or jug and sealed thereto, and a heat-insulating filler in the space between the jar or jug and the casing, the mouth of the casing being interlocked with the jar or jug to hold the latter in fixed relation with respect to the casing independently of any supporting action of the filler.

5. A jacketed container comprising an outer metal casing having a frusto-conical upper end, and an inner receptacle of pottery ware having adjacent to its mouth a groove corresponding substantially in shape to that of the frusto-conical casing end and entered by the mouth portion of the latter, the said end being sealed into the said groove and the inner receptacle being otherwise spaced from the outer casing, there being means for retarding the conduction of heat through the space between the said receptacle and casing.

6. A jacketed container comprising an outer metal casing having a frusto-conical upper end, and an inner receptacle of pottery ware having adjacent to its mouth a groove entered by the said upper end portion of the casing, the said end being sealed into the said groove and the inner receptacle being otherwise spaced from the outer casing, the inner receptacle having moisture impervious inner and outer surfaces.

Signed at Macomb, Illinois, Dec. 10, 1923.

PEARL H. BRAINARD

448

June 17, 1924. 1,497,764

W. W. SIMONSON ET AL

HEAT INSULATED VESSEL AND PROCESS FOR MAKING THE SAME

Filed June 1, 1918. 3 Sheets-Sheet 1

Fig. 4



Fig. 1

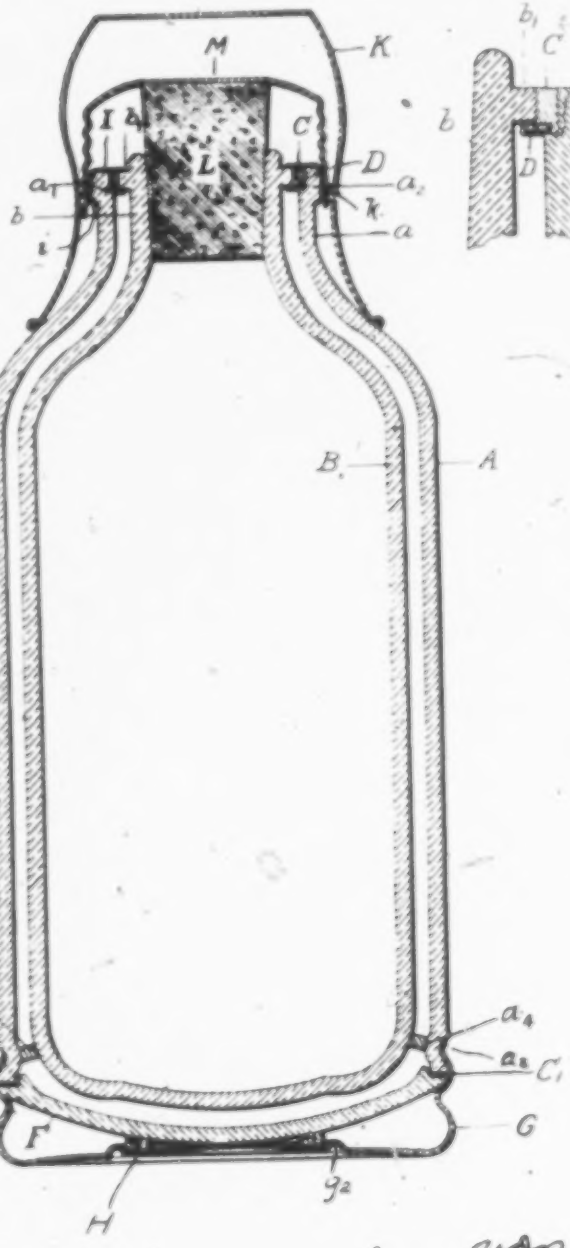


Fig. 2.

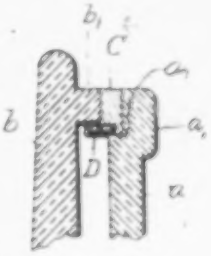
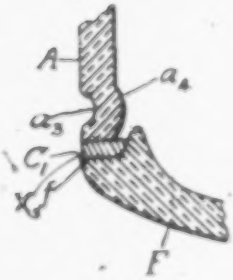


Fig. 3.



Lewis V. D. Blau
William W. Simonson
INVENTORS.

BY Edson and Stewart
ATTORNEYS.

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June 17, 1924. 1,497,764

W. W. SIMONSON ET AL

HEAT INSULATED VESSEL AND PROCESS FOR MAKING THE SAME

Filed June 1, 1918 3 Sheets-Sheet 2

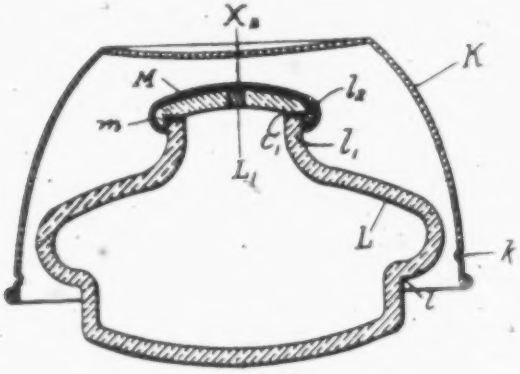


Fig. 7.

Fig. 6.

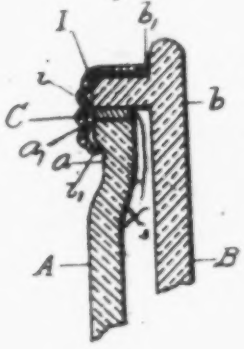
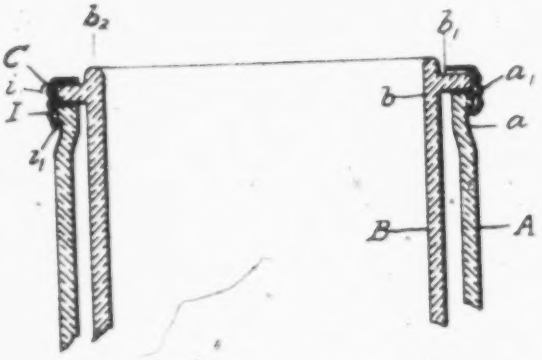
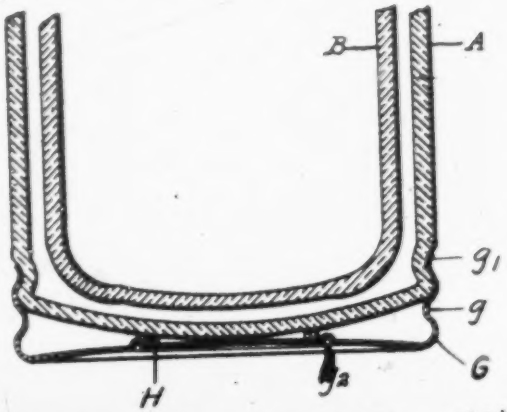


Fig. 5.





W. W. Blair

INVENTOR

BY Edgar and Steva

ATTORNEY

June 17, 1924. 1,497,764

W. W. SIMONSON ET AL

HEAT INSULATED VESSEL AND PROCESS FOR MAKING THE SAME

Filed June 1, 1918 3 Sheets-Sheet 3

Fig. 9.

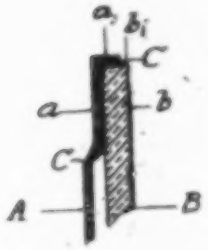


Fig. 14.

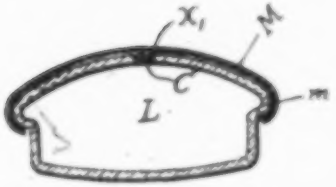


Fig. 10. Fig 13.

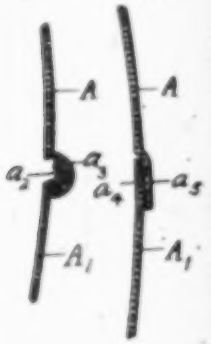
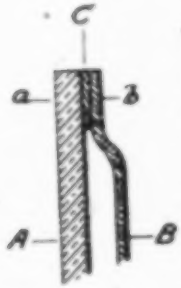


Fig. 12.



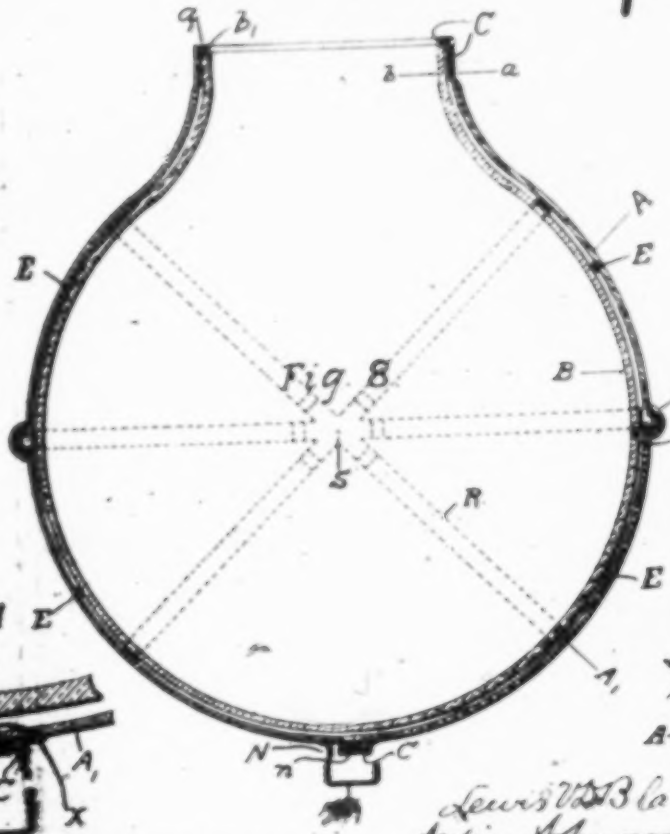


Fig. 8

Fig. 15.

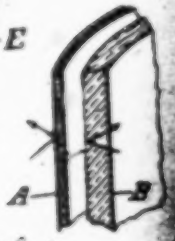
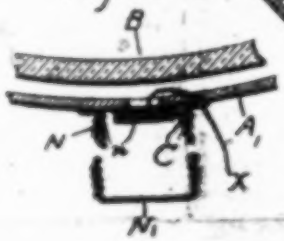


Fig. 11



Lewis W. Blair
William W. Simonson INVENTORS

BY Edson and Stevens

ATTORNEYS

UNITED STATES PATENT OFFICE. 453

WILLIAM W. SIMONSON AND LEWIS VD. BLAIR, OF CINCINNATI, OHIO, ASSIGNORS TO THE MANTLE LAMP COMPANY OF AMERICA, OF CHICAGO, ILLINOIS, A CORPORATION OF LLLINOIS.

HEAT-INSULATED VESSEL AND PROCESS FOR MAKING THE SAME.

Application filed June 1, 1918. Serial No. 237,831.

whom it may concern:

it known that WILLIAM W. SIMONSON ewis VD. BLAIR, citizens of the United residing at Cincinnati, in the county amilton, and State of Ohio, have in- certain new and useful Improve- in Heat-Insulated Vessels and Proc- for Making the Same, of which the ing is a specification.

r invention relates to heat insulated ermetically sealed vessels and includes d or seal to unite adjacent parts of nposite article such as vacuum insu- vessels, within the jackets of which it ired to maintain a vacuum for an nite period of time.

retofore, the glass walls of vacuum s have been made very thin so that necks may be secured together at their ion by autogenous welding (a process cterized by the fusion of adjacent), but this method is objectionable uch as thin walls are exceedingly e and autogenous welding involves zed heating and cooling, and conse- stresses in the completed vessel due unequal expansions of different por- of their walls. Glass being a poor ctor of heat, the temperature of re- portions of the walls are much lower those at and near the weld, the result that, when the temperatures are equal- cooling, the highly heated parts con- in a much greater degree than the parts, producing stresses which tend rupt the finished vessel, and which ften do so if aided by shocks or by ick expansion or contraction attend- dden changes in temperature. If au- us welding of thick glass is attempted, ss is liable to break during the cool- eration.

application of autogenous welding glass presents other and additional ties, because if the operator is un- or careless the temperature of the the weld is likely to be raised above n point and the glass melted away. herefore, highly advantageous and e in the making of hermetically vessels or closures, to avoid heating to such temperatures as necessarily togenous welding, however those produced.

Parts of glass articles, such as composite ornamental window panes, have been fused to intervening glass bonds having a relatively lower fusing temperature, but the united parts are expanded and fused at or near the joints, with the result that, upon cooling, contraction is resisted by the cooler and less contractable portions, thereby establishing permanent stresses which accentuate the danger of breakage of the finished article. If the article be a single-wall vessel, having an irregular or angular design, or a double-wall heat-insulated vessel, wherein the walls are united by an angular or abruptly curved piece of glass, the danger of breakage is still more pronounced.

We have found that the desideratum in the production of composite glass articles, is to unite the parts thereof under such thermal conditions that the original molecular dispositions will not be affected, and that, if affected in any considerable degree, the resulting expansion and contraction will be uniform throughout the entire structure.

This result, we have discovered, may be produced by employing a non-vitreous fusible bond, having a tenacity approximating, or even exceeding, the tenacity of glass, which fuses at a temperature below the temperature at which the united parts will fuse, and has the capability, when fused, of directly adhering to such parts, and of acquiring strong adherence when solidified.

When substances such as different kinds of glass, are united by fusion there is a blending of the molecules due to the mutual miscibilities of the substances, but when only one of two substances to be united is fused the union is due to adhesion only, miscibility not being a factor.

When in the claims, the term immiscible is used, it has reference, not to substances one of which will blend into the other if fused and fluid, so as to produce upon cooling a coherent mass, but to substances which after fusion and cooling will remain as two distinct unblended adherent masses.

By using an immiscible bond, and thus avoiding fusion of the united parts of composite articles, said parts may be of any desired thickness, or composed of unfusible material, such as, for instance, artificial fibre. In heat-insulated vessels the outer exposed part may be made from thin

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stronger material than the inner or shielded part, for protective reasons, and it may be made of metal for the same reason. The walls may be made of glass of a refractory nature, which on account of its high fusing point and the consequent strains induced, could not be practically employed in the manufacture of vacuum vessels heretofore produced.

The invention is distinguished from products in which the bond uniting two adjacent fused parts is of vitreous character, the bond herein described being secured to the united walls by adhesion only, said walls being left in their original unfused condition. Adhesion is, however, sufficiently great for all practical purposes, it having been found that ordinarily when fractures have been intentionally made, particles of the glass remain adherent to the bond.

The substance which we may employ is an organic metal compound, usually prepared from an organic exudate, and treated by heat while fused to make it hard and tenacious, chemically stable under ordinary conditions, insoluble in water, quite elastic, and, after having thus been thermally treated, capable of withstanding heat at temperatures considerably above the boiling point of water without becoming fused or softened, or suffering deterioration. There are temperatures at which, as for instance 525° F., it will decompose, but below these temperatures its several useful and characteristic properties remain unimpaired.

This substance is, for reasons already stated, more satisfactory than a fused glass bond, and, furthermore, is capable of universal applicability because it may be made adherent, not only to glass, but to metals and other substances, of which the walls of vessels may be made. It may even be employed as a bond in devices or articles in which fusible glass cannot be used, such as are composed of metal, wood, or artificial fibre or other artificial compositions.

The compound which we prefer to employ, is made from lac, or from shellac which is inherently a poor conductor of heat.

The selected substance, if it be shellac, may be subjected to a preliminary treatment whereby the associated waxy and fatty substances are eliminated. The preliminary process consists in dissolving the ordinary shellac of commerce in a warm and dilute solution of caustic soda, the proportions being 100 parts by weight of shellac, 4.5 parts by weight of caustic soda and 1000 parts by weight of water. The shellac should be slightly in excess of the quantity which is dissolved, in order that all of the caustic soda will be utilized and no free parts of the caustic soda which may produce un-

ing, the impurities are removed [illegible] surface of the still turbid solution [illegible] then clarified by adding a clarifying [illegible] such as powdered kaolin. The [illegible] which is a clarified solution of a [illegible] sodium compound in water, is used [illegible] preparation of the above described [illegible] metal compound, the metal constituent [illegible] which may be lead, calcium, barium, [illegible] or other metal.

In order to produce an unfused [illegible] lead compound, which when fused will [illegible] here to metal, glass and other substances [illegible] acquire great adherence when solidified [illegible] mix a clarified solution of the shellac [illegible] compound, above described with lead [illegible] and a sufficient quantity of water to [illegible] the precipitate of the resulting [illegible] product, which is a shellac lead compound [illegible] approximating Pb, (C_{40}, H_{71}, O_{11}) [illegible] appear as small flakes which are [illegible] washed and freed from excess lead [illegible] and the sodium acetate produced by the [illegible] action. The proportions of these substances [illegible] are 100 parts by weight of the shellac [illegible] um compound, to 22.5 to 25 parts by weight [illegible] of lead acetate and water in the stated [illegible] tity. The flakes of the shellac lead [illegible] pound are then dried in any convenient [illegible] ner.

The compound is now ready for use [illegible] bond. In producing a seal the compound [illegible] may be applied as a solute in acetone [illegible] acetone, or a comminuted mass of the [illegible] pound may be fused onto one of the [illegible] by slightly heating that part and pressing [illegible] it against some of the material, or it may [illegible] be compressed into convenient form, as [illegible] instance in the form of a gasket, and placed [illegible] in position between the parts that are [illegible] united, all three elements being then heated [illegible] in some convenient way as in an oven [illegible] sufficiently high temperature, to produce [illegible] fusion of the compound, the heat treatment [illegible] being maintained for a period of from [illegible] to nine hours as may be found necessary [illegible] cording to the mass of material [illegible] treated. This heat treatment effects [illegible] elimination of a part or the whole [illegible] constitutional water of the compound [illegible] duces polymerization (re-arrangement [illegible] the molecules) and increases the [illegible] the fused compound. Elimination [illegible] constitutional water is accompanied [illegible] merization, condensation and [illegible] the compound. The shellac lead [illegible] above described fuses at about [illegible] barium compound at about 280° [illegible] calcium at about 340° F. When [illegible] of the compound is fused, it [illegible] the contacting surfaces of the [illegible] longation of the heat treatment [illegible] the bond, even if the temperature [illegible] raised, but a better bond is [illegible]

stronger material than the inner or shielded part, for protective reasons, and it may be made of metal for the same reason. The walls may be made of glass of a refractory nature, which on account of its high fusing point and the consequent strains induced, could not be practically employed in the manufacture of vacuum vessels heretofore produced.

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rior adherent compound may be by mixing the shellac lead com- ith a wax-free shellac. The wax- ac is obtained by taking a portion r solution of shellac sodium com- d adding thereto a small excess of as hydrochloric acid in order to the sodium in the form of a sol- m salt, and precipitate the shellac. ac lead compound and the wax-free e preferably mixed in the propor- one part by weight of the shellac pound and two parts by weight of free shellac. This mixed substance d for use and fused in situ in the nner as the shellac lead compound. mperature of fusion may be varied ing the proportions of these com- the fusion point being raised by g the relative quantity of the metal- ative and also being widely varied bstitution of different metals in the derivative. For instance, a calcium d has an appreciably higher initial point than a similar compound th lead, the difference between the sion points of these two compounds proximately 100° F. When a bond low initial fusion temperature is a lac without a metallic substitution mployed and treated by the thermal escribed.

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mpound is not herein claimed per claimed as a bond which is espe- ful for uniting parts of hermetically ssels and as a material which is for use in the performance of our In their generic aspect, our vessels n addition to the vacuum vessels of r art with which we are familiar, l element, namely a binding com- which, while possessing all of the roperties of a glass bond and being ndestructible under normal thermal influences, will by adhesion unite s or other substances substantially as glass will unite with glass by

dition to modifying the fusion temperatures of the bonding ons, the chief value of the united ds rests in their influence over the nsion coefficients of the bonding Thus, a mixture of two parts of shellac and one part of the lead if the same, has very nearly the t of expansion as a glass com- 11.7%, potash, .6%, lime 4.7% aluminia .6% while a bonding mass composed of two parts of wax-free shellac and one part of the calcium compound of the same, will usually rend asunder, or chip, the adjacent surfaces of joined glass of the same composition immediately on cooling, or presently thereafter.

Where porous substances as for instance metal or fibre are employed for hermetically sealed vessels, they may be made air tight by applying a coating of the compound in an alcohol or acetone solution and maturing the same by heat treatment.

When we refer to an adherent bond, we mean to exclude solder and kindred substances which bind bodies "partly by chemical attraction and partly by cohesive force" (Century Dictionary and Cyclopedia, volume 7, edition of 1899.)

The drawings illustrate several forms of vessels in which the bond may be used.

Figure 1, shows a vertical section of one form of heat-insulated or vacuum vessel, in which our bond may be used;

Figure 2, is a fragmentary enlarged sectional view showing a bond disposed between the concentric necks of a heat-insulated or vacuum vessel;

Figure 3, is a fragmentary sectional view showing a bond uniting the parts of a sectional jacket;

Figure 4, represents a sustaining or carrying ring;

Figure 5, shows a vertical section of a modified form of heat-insulated or vacuum vessel in which our bond may be used;

Figure 6, is an enlarged fragmentary sectional view of the modified construction of Figure 5;

Figure 7, is a sectional view of a heat-insulated or vacuum stopper and a drinking cup;

Figure 8, is a sectional view of another form of heat-insulated or vacuum vessel in which our bond may be employed;

Figures 9, 10 and 11, are enlarged sectional views showing parts of vessels revealed in Figure 8;

Figure 12, is a fragmentary view in section of a modification containing a thickened jacket;

Figure 13, is a fragmentary sectional view showing a modification of the joint uniting parts of the jacket;

Figure 14, is a sectional view of a modified form of heat-insulated or vacuum stopper:

Figure 15, is a fragmentary sectional view showing the positions of reflecting surfaces.

Referring to Figures 1, 2, 3 and 4, A, is the outer jacket, which at the upper end is provided with a neck, a, an internal seat, a^1, and an external flange, a^2.

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parts of the jacket;

Figure 14, is a sectional view of a modi-
fied form of heat-insulated or vacuum
stopper;

Figure 15, is a fragmentary sectional view
showing the positions of reflecting surfaces.

Referring to Figures 1, 2, 3 and 4, A, is
the outer jacket, which at the upper end is
provided with a neck, a, an internal seat, a^1,
and an external flange, a^2.

B, is a container preferably made of glass,

disposed within the jacket, A, and having at its upper end a neck, b, which is provided with an external flange, b^1, the diameter of which is slightly less than the internal diameter of the neck, a, to admit of the passing of the neck, b, through the neck, a.

C, represents an hermetical seal of a composition herein described, this composition being an organic substance which, as above stated, is capable, when fused and solidified, of strongly adhering to the necks of the jacket and the container.

The seat, a^1, is situated slightly below the flange, b^1, so as to leave room for a thin sustaining ring, D, between the seat and flange. This ring, D, is of such diameter that it may fit within the seat, a^1, and is of such width as to extend inward beyond said seat, a^1, and underneath the flange, b^1. Said ring is cut, split or made in sections, d, so that it may be readily placed in position, the parts thereof being separately introduced under the flange, b^1, when the container is lifted to admit of the insertion. The composition constituting the seal, C, may be applied to the ring, D, in such manner as to extend from the seat, a^1, to the underside of the flange, b^1, to both of which elements it becomes firmly adherent when fused and solidified, or it may be introduced in such manner as to fill the unoccupied space between the necks. The ring, D, may act as a carrier for the composition constituting the bond, and, when the device is completed, assist in sustaining the super-imposed parts and cause the composition to be under a compressional instead of a tensional strain. If the composition is applied to the ring before it is placed in position, the ring should be heated so that the composition will adhere thereto without pressure. In some instances the ring may be dispensed with and the unfused composition packed into the space between the seat, a^1, and the flange, b^1, before fusion and adhesion take place.

The jacket, A, is provided near its lower edge with a contracted portion which produces on the outside of said jacket a circumferential groove, a^3, and an internal circumferential bead, a^4.

The jacket, A, is provided with a dished bottom, F, having a marginal seat, f, for receiving the lower edge of the jacket, A. A bond, C^1, of our composition is disposed between the seat, f, and the edge of the [illegible] when fused, the composition will effectually secure the bottom, F, in position.

Braces, E, (which may be a continuous ring) span the space between the jacket, A, and the container, B, the bead, a^4, constituting a support therefor. These braces tend

made of our bonding material or [illegible] rial associated with our bondi[illegible] and caused to adhere to the jack[illegible] tainer by heat treatment.

G, is a substantially flat cap, [illegible] of which is crimped into the groo[illegible] the jacket, A, at, g^1. The cap, G[illegible] vided with a circular corrugati[illegible] order to stiffen the same.

H, is a cushion of felt or cork w[illegible] be in the form of either a ring or [illegible] arranged separate pieces. This cu[illegible] upon the cap, G, just within the [illegible] tion, g^2, which prevents its lateral [illegible] ment, and it extends upward int[illegible] with the bottom of the jacket. Thi[illegible] relieves the vessel of shocks, and [illegible] prevent the fracture of any of its [illegible]

The top of the jacket is provide[illegible] protecting ring, I, constituting a p[illegible] the outer jacket. This ring extend[illegible] joint between said jacket and the [illegible] B, and has a flange, i, crimped to e[illegible] underside of the flange, a^2, wher[illegible] retained in a fixed position on t[illegible] This protecting ring is externally [illegible] for the reception of the threaded c[illegible] portion of a cap, M. The mou[illegible] container B, is closed by a cork, L, [illegible] securely held in position by the [illegible] This cap may be screwed up or do[illegible] der to be removed and thus re[illegible] cork, L, or press it downward int[illegible] in the neck of the container, B.

K, is a drinking cup of sufficient [illegible] diameter to telescope over the thre[illegible] tion of the cap, M, inwardly proje[illegible] dentations of teats, k, being pro[illegible] engagement with the threads of [illegible]

In the form shown in Figures [illegible] the internal seat, a^1, and the rin[illegible] dispensed with, and the external [illegible] is made of sufficient diameter to e[illegible] the upper edge of the neck, a. In [illegible] struction the bonding composition [illegible] posed between the flange, b^1, and [illegible] edge of the neck, a, upon which it [illegible] this position, the strains borne by [illegible] ing composition, are entirely com[illegible]

It is not necessary, to provide [illegible] bottom for the outer jacket of a [illegible] lated or vacuum vessel of this t[illegible] much as the container, B, may be [illegible] through the neck of the jacket, [illegible] large enough to receive it.

The protecting ring, I, and [illegible] in this construction, may be [illegible] those employed in connection [illegible] insulated or vacuum vessel di[illegible] ure 1.

The heat-insulated or va[illegible] shown in Figure 7, is hol[illegible] vided with a seat, l, which is [illegible]

disposed within the jacket, A, and having at its upper end a neck, b, which is provided with an external flange, b^1, the diameter of which is slightly less than the internal diameter of the neck, a, to admit of the passing of the neck, b, through the neck, a.

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Braces, E, (which may be a continuous ring) span the space between the jacket, A, and the container, B, the bead, a^4, constituting a support therefor. These braces tend to prevent a pendulous movement of the container within the jacket, and they may be made of our bonding material or [illegible] rial associated with our bond[illegible] and caused to adhere to the jac[illegible] tainer by heat treatment.

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...er. The stopper is provided with ...ily projecting neck, l^1, upon which ...ed a closing cap, L^1, having a cir...ial depending flange, l^2. The ...aterial, C^1, rests upon the upper ...f the neck, l^1, and between said ...d periphery of the cap, L^1. A pro...p, M^1, of metal or other suitable ...is spun or crimped over the mar...e cap, L^1, so as to become perma...tached thereto. The crimped por...of the cap, M^1, conceals the bond...rial from view. The cap, L^1, may ...ded with exhaust opening, X^3, ...which the vacuum may be drawn in ... way.

... drinking cup, having an inwardly ... bead, k, which is adapted to en... external screw threads of the pro...ing, I, of the heat-insulated or ...essel. This drinking cup serves ...ng means for the stopper, L.

...odified heat-insulated or vacuum ...own in Figures 8, 9, 10 and 11, is ...ximately spherical instead of cy...form. The container, B, is of one ...e the containers shown in Figures ... but the jacket instead of being ...s, is composed of an upper section, ... lower section, A^1, which, except ...haust opening, X, is closed at its ...The section, A, is provided with a ... having an inwardly projecting ..., extending over the edge of the ...of the container, B, the bonding ...being disposed between said flange ...edge, and, if desired, made to fill ... between the necks, a, and, b. In ...ruction shown in Figure 12 the ... is thicker than container, B, and ..., is unflanged, the bonding com...eing disposed within the annular ...ween the necks, a, and b.

...tions of the jacket may be united ...ed joint, a^2, a^3, as shown in Fig...d 10 or by a lap joint, a^4, a^5, as ... Figure 13. The joint, however ...hould be hermetically sealed by ...oldering or by the use of the bond...ound herein described.

... vacuum bottles are made in ... the collapsing strain due to at... pressure becomes very great and ...l shaped bottle is best adapted to ... these strains. The atmospheric ...gainst the inner wall of the con...duces tensional strains which may ...lized by a re-inforcement which ... the form of bands, R, encircling ...er as shown in Figure 8. As il...ach of these bands follows the ...mference of the container, the ...ted together as by plates, thin to avoid contact with the inner wall of the jacket.

The means for closing the exhaust opening, X, is a small metal plate, n, carrying a layer, C, of the bonding composition, sealing being accomplished by heating the bonding material and pressing the same against the jacket after a sufficient degree of vacuum has been established. The seal is protected by a cap, N^1, screwed onto a collar, N, soldered or otherwise secured to the jacket.

Th... stopper, L, shown in Figure 14, is shown blown in one piece and as having an exhaust opening, X^1, which, after a vacuum has been established, is closed by bonding material, C, or by bonding material reinforced by a plate of metal, such as, n, in Figure 11. A protective cap, M^1, is used in this construction to obscure and protect the seal, the margin of the cap being spun or crimped over an integral bead, m, of the stopper.

The exhaust opening through which the air is drawn may be formed in the bonding composition at any suitable point, as at, X^2, Figure 3, by using a suitable core, which must however be withdrawn while the bonding material is still in a plastic condition. The resulting aperture will serve the same purpose as the opening, X, in the jacket or the openings, X^1, X^2, in the stoppers, and may be similarly closed.

The vacuum is drawn in a usual way the vessel being preferably heated so that the moisture as well as the air is exhausted from the vacuum space.

The final sealing of the vacuum chamber is done in vacuo in the usual manner, heat being applied by radiation, or by conduction through contacting elements, to fuse the bonding compound and complete the vacuum seal.

Loss of radiant heat will be restricted by the use of the usual silvering, or by polishing of the walls of the vacuum space.

In Figure 15, A, represents an opaque outer jacket and, B, the wall of the transparent container. The jacket is provided with an external reflecting surface and the wall, B, is also provided with an external reflecting surface. Radiant heat from external sources is reflected from the jacket, A, as shown by the bent arrow, and radiant heat from internal sources is reflected back through the diathermanous wall, B, as shown by the bent arrow. The contents of the container will therefore be maintained at a uniform temperature, external heat being excluded and internal heat being retained.

Among the advantages of our invention are the elimination of strains produced by fused joints, the avoidance of distortions of the glass which are liable to occur at high

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Among the advantages of our invention are the elimination of strains produced by fused joints, the avoidance of distortions of the glass which are liable to occur at high temperatures, the ability to use stronger, or thicker, cheaper and more easily obtainable

glass, as well as the possibility of substituting metal, porcelain or other substances for glass in the outer jacket, or wherever desired.

Our invention enables us to make vacuum utensils or other heat insulated vessels of a wide variation of limits in sizes, shapes and uses, and when made wholly or partially of glass to be of sufficient strength and cheapness to be used as shipping containers for perishable foods. The thin glass walls of the ordinary vacuum vessel make the vessel inherently weak and liable to collapse under atmospheric pressure if vessels are made in large sizes, or when such vessels are subjected to the abuse of normal transportation handling. The ordinary vacuum vessel is necessarily of a design compelled by the use of the autogenous weld at the necks of the container and the jacket, the design being determined by the ability of the glass maker to construct the lower portion of the jacket and effectuate the closure thereof. Our invention admits of the making of the jacket of a plurality of bonded parts of any desired pattern, and thus give to the entire vessel any suitable design.

By the use of our adherent compound, we are enabled to make the outer jacket, as well as other parts of our vessel, in separate pieces and to firmly unite these pieces, even though they are composed of substances which cannot be united by fusion. The joints which we produce by the use of our fusible and adherent compound, are especially useful where joints produced in known ways, as, for instance, by soldering, brazing, sweating or interlocking, must now be employed.

When in the claims we use the expression "heat treated," we refer to a material such as an organic exudate, or derivative of the same, which has been so changed by heat, as to harden it and raise its melting or fusion temperature, and make it strongly adherent when cooled.

The expression "matured," as employed in the claims, identifies a bond composed of any water-insoluble organic substance, combined or uncombined, or mixed or unmixed with metallic or other substances, and remaining solid at temperatures below 212° F., which, either before or after being applied, has been so chemically or physically altered by partial or complete heat treatment as to enhance its normal adherence to a contacting substance upon evaporation of its solvent, if it be in solution, or upon solidification, if it be in a fused condition; and the expression "adherent bond" or adherently secured, excludes solder, which, when molten, is miscible with metals, and glass, which when fused, is miscible with glass, neither of these substances being ad-

The term "viscous," as employed refers to that property of an organ stance, exudate or material, such as parted to it by a solvent or by fu a substance being viscous when in dissolved or a fused condition. W a substance is applied as a solution, treatment will evaporate the solv thereafter act upon the substance ture it in same way that it matur initially undissolved substance.

The term "condensed" as herein emp refers to the rearrangement of molec produce a product which is different the starting material.

The expression "chemically stable" to that quality of a substance which it to remain unaffected by any other stance which comes in contact with such uses as described.

The expression "abnormal adherence" reference to the fact that the substance ployed as a bond has greater adhera adjacent objects than it would hav were untreated.

An organic substance, such as lac, t as herein described, may be either par or completely matured, according t length of the period of treatment, temperature employed, and thermal ment may be continued to effectuate plete induration of the substance, w becomes infusible, unless the heat is to cause dissociation of the partial durated product. The substance cons a bond possessing considerable adhes only matured in a limited degree, but matured in a maximum degree, its a to adhere to solids when solidified fr state of fusion, is greatly enhanced, also its ability to resist the action o vents, the degree of the adhesion a the insolubility being substantially co surate with the degree of the heat trea

Having thus described our inv what we claim and desire to secure by ters Patent is:

1. A heat-insulated jacketed ves cluding an inner container, an outer and an adherent matured organic solidified in situ elastically unitin jacket and said container.

2. A heat-insulated jacketed ves sisting of a plurality of unfused p an intervening, condensed and har ganic bond fused to said unfused p solidified in situ.

3. A heat-insulated jacketed ves cluding an inner container and jacket united by an intervening bond, said bond being composed tured organic material solidified which is less fusible than the m terial from which it is produced

glass, as well as the possibility of substituting metal, porcelain or other substances for glass in the outer jacket, or wherever desired.

Our invention enables us to make vacuum utensils or other heat insulated vessels of a wide variation of limits in sizes, shapes and uses, and when made wholly or partially of glass to be of sufficient strength and cheapness to be used as shipping containers for perishable foods. The thin glass walls of the ordinary vacuum vessel make the vessel inherently weak and liable to collapse under atmospheric pressure if vessels are made in large sizes, or when such vessels are subjected to the abuse of normal transportation handling. The ordinary vacuum vessel is necessarily of a design compelled by the use of the autogenous weld at the necks of the container and the jacket, the design being determined by the ability of the glass maker to construct the lower portion of the jacket and effectuate the closure thereof. Our invention admits of the making of the jacket of a plurality of bonded parts of any desired pattern, and thus give to the entire vessel any suitable design.

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3. A heat-insulated jacketed ves... cluding an inner container and ... jacket united by an intervening ... bond, said bond being composed ... tured organic material solidified ... which is less fusible than the ma... terial from which it is produced.

4. A heat-insulated vessel ha...

by a water-insoluble, chemically-bond of organic material, solidified and having abnormal adherence to arts.

heat-insulated vessel having parts by a water-insoluble, chemically-bond of organic material associated metal, solidified in situ and having ab-adherence to said parts.

heat-insulated vessel including an vitreous container, an outer jacket, matured elastic bond solidified in he container having gentle curves and devoid of angles or abrupt curves, by expansive thrusts are compensated all parts thereof, and danger of frac-y changes of temperature minimized.

heat-insulated jacketed vessel, in-g an inner container composed of an outer jacket and a matured elastic solidified in situ, whereby the glass inner container may be of a refrac-nature, and capable of withstanding changes of temperature without re.

heat-insulated jacketed vessel in-g a plurality of parts, and a matured of dissimilar material, said bond be-mposed of an organic substance which ns hard at 212° F., and which is ca-of strongly adhering to said parts solidified in situ from a state of fusion.

Bodies of solid material adherently by a matured metallic organic com-solidified in situ containing an or-exudate.

A heat-insulated jacketed vessel, in-g an inner container and an outer , one of which is made of vitreous ma-and an adherent non-vitreous ma-bond solidified in situ.

A heat-insulated jacketed vessel, in-g an inner container and an outer , both made from vitreous material n adherent heat-treated non-vitreous solidified in situ, said container and having substantially uniform in-stresses throughout their structures.

A heat-insulated jacketed closure, parts thereof united by a non-vit-bond solidified in situ, said bond be-ndered adherent by fusion being in-in water and being infusible at tem-res below 212° F.

A heat-insulated jacketed closure, in-g an adherent bond solidified in situ mprising a substance which is solu-alcohol and insoluble in water, said ce being infusible and non-adhesive peratures below 212° F.

heat-insulated vessel, including a mposed of a heat-treated, matured,

15. A seal for heat-insulated closures consisting of adjacent parts united by an adherent bond solidified in situ which is infusible at 212° F., said bond being composed of organic material which in its original state is non-adhesive.

16. A composite heat-insulated jacketed vessel, including two parts united by an organic bond, said bond being insoluble in water, infusible at 212° F., made adherent by fusion and heat treatment, and having a higher fusion temperature than its initial fusion temperature.

17. A composite heat-insulated jacketed vessel, consisting of a plurality of glass sections and an intervening bond uniting said sections, said bond being non-vitreous, insoluble in water, immiscible with glass, condensed and hardened by heat treatment, and having a coefficient of expansion approximating that of glass.

18. A composite heat-insulated jacketed vessel, consisting of a plurality of vitreous parts and an intervening, organic bond hardened by treatment and adherently secured to said parts, said bond having a coefficient of expansion substantially equal to those of the vitreous parts of the vessel.

19. A heat-insulated jacketed vessel, including a plurality of parts and an intervening bond immiscible therewith, said bond being solidified in situ containing a heat treated organic exudate, having a lower fusion temperature than the united parts and being chemically stable under ordinary conditions, adhesive when fused and adherent when cooled.

20. A composite article having parts united by a water-insoluble organic bond adherently joined to said parts, said bond being solidified in situ, indecomposable at all temperatures below 525° F., and infusible at 212° F.

21. A heat-insulated jacketed vessel, including an inner container, an outer jacket, and a bond therefor, solidified in situ and composed of a matured substance of low heat-conductivity which is adherently secured to unfused surfaces of said container and jacket.

22. A heat-insulated jacketed vessel, including an inner container and an outer jacket, united by a fused organic bond matured and solidified in situ and said outer jacket being composed of a plurality of parts united by a fused organic bond.

23. A heat-insulated jacketed vessel, having an inner container and an outer jacket composed of an upper and a lower section, said inner container being provided with an opening at its upper extremity and adjacent thereto hermetically sealed by a matured

...y a water-insoluble, chemically-
...bond of organic material, solidified
...and having abnormal adherence to
...arts.

...heat-insulated vessel having parts
...by a water-insoluble, chemically-
...bond of organic material associated
...metal, solidified in situ and having ab-
...l adherence to said parts.

...A heat-insulated vessel including an
...vitreous container, an outer jacket,
...a matured elastic bond solidified in
...he container having gentle curves and
...devoid of angles or abrupt curves,
...by expansive thrusts are compensated
...all parts thereof, and danger of frac-
...y changes of temperature minimized.

...A heat-insulated jacketed vessel, in-
...g an inner container composed of
..., an outer jacket and a matured elastic
...solidified in situ, whereby the glass
...e inner container may be of a refrac-
...nature, and capable of withstanding
...n changes of temperature without
...re.

...A heat-insulated jacketed vessel in-
...g a plurality of parts, and a matured
...of dissimilar material, said bond be-
...mposed of an organic substance which
...ns hard at 212° F., and which is ca-
... of strongly adhering to said parts
...solidified in situ from a state of fusion.

...Bodies of solid material adherently
...l by a matured metallic organic com-
...l solidified in situ containing an or-
... exudate.

...A heat-insulated jacketed vessel, in-
...g an inner container and an outer
..., one of which is made of vitreous ma-
... and an adherent non-vitreous ma-
...bond solidified in situ.

...A heat-insulated jacketed vessel, in-
...g an inner container and an outer
..., both made from vitreous material
...n adherent heat-treated non-vitreous
...solidified in situ, said container and
... having substantially uniform in-
...stresses throughout their structures.

...A heat-insulated jacketed closure,
..., parts thereof united by a non-vit-
...bond solidified in situ, said bond be-
...ndered adherent by fusion being in-
...e in water and being infusible at tem-
...res below 212° F.

...A heat-insulated jacketed closure, in-
...g an adherent bond solidified in situ
...mprising a substance which is solu-
... alcohol and insoluble in water, said
...nce being infusible and non-adhesive
...peratures below 212° F.

...heat-insulated vessel, including a
...mposed of a heat-treated, matured,
...soluble, chemically stable substance
...d in situ adherently secured to ad-
...parts of said vessel.

15. A seal for heat-insulated closures consisting of adjacent parts united by an adherent bond solidified in situ which is infusible at 212° F., said bond being composed of organic material which in its original state is non-adhesive.

16. A composite heat-insulated jacketed vessel, including two parts united by an organic bond, said bond being insoluble in water, infusible at 212° F., made adherent by fusion and heat treatment, and having a higher fusion temperature than its initial fusion temperature.

17. A composite heat-insulated jacketed vessel, consisting of a plurality of glass sections and an intervening bond uniting said sections, said bond being non-vitreous, insoluble in water, immiscible with glass, condensed and hardened by heat treatment, and having a coefficient of expansion approximating that of glass.

18. A composite heat-insulated jacketed vessel, consisting of a plurality of vitreous parts and an intervening, organic bond hardened by treatment and adherently secured to said parts, said bond having a coefficient of expansion substantially equal to those of the vitreous parts of the vessel.

19. A heat-insulated jacketed vessel, including a plurality of parts and an intervening bond immiscible therewith, said bond being solidified in situ containing a heat treated organic exudate, having a lower fusion temperature than the united parts and being chemically stable under ordinary conditions, adhesive when fused and adherent when cooled.

20. A composite article having parts united by a water-insoluble organic bond adherently joined to said parts, said bond being solidified in situ, indecomposable at all temperatures below 525° F., and infusible at 212° F.

21. A heat-insulated jacketed vessel, including an inner container, an outer jacket, and a bond therefor, solidified in situ and composed of a matured substance of low heat-conductivity which is adherently secured to unfused surfaces of said container and jacket.

22. A heat-insulated jacketed vessel, including an inner container and an outer jacket, united by a fused organic bond matured and solidified in situ and said outer jacket being composed of a plurality of parts united by a fused organic bond.

23. A heat-insulated jacketed vessel, having an inner container and an outer jacket composed of an upper and a lower section, said inner container being provided with an opening at its upper extremity and adjacent thereto hermetically sealed by a matured organic bond to the upper section of the outer jacket, the two sections of the outer jacket being hermetically sealed together by

a matured organic bond and a part or parts of the vessel being made from vitreous or frangible material.

24. A heat-insulated jacketed vessel, including an inner container and an outer jacket united by a fused, heat-treated organic bond, said outer jacket being composed of a plurality of dissimilar bonded parts.

25. A heat-insulated jacketed vessel, having an inner container and an outer jacket bonded to said container, said outer jacket being composed of a plurality of bonded vitreous parts, one of which is substantially coextensive with the inner container.

26. A heat-insulated jacketed vessel, having an inner container and an outer jacket, said jacket being formed in sections, and said sections having overlapping parts associated with an organic matured adherent, air-tight bond.

27. A heat-insulated jacketed vessel, having an inner container and an inherently stronger outer jacket, and an intervening adherent matured organic bond therefor solidified in situ.

28. A heat-insulated jacketed vessel, including an inner glass container and an outer glass jacket made from heavier material than said inner container, and an intervening matured bond solidified in situ.

29. A closure, adjacent parts of which are united by an adherent, non-vitreous, matured bond formed in situ by fusion.

30. A closure, having an unfused part thereof sustained by a non-vitreous matured bond formed in situ by fusion and adherently uniting said part to said closure.

31. An hermetically sealed closure, including a non-vitreous and substantially non-metallic matured bond of relatively low fusibility, said bond being rendered adherent by fusion in situ.

32. An hermetically sealed closure, including glass sections and a non-vitreous bond for said glass sections of lower fusibility than glass, said bond being composed of a material which is physically and permanently altered and rendered adherent by fusion in situ.

33. A hermetically sealed closure comprising a plurality of parts, united by a non-vitreous bond, said bond being rendered adherent by fusion and heat treatment in situ.

34. A composite hermetically sealed closure, including a glass part thereof, said glass part being united to another part of [illegible] by a non-vitreous substantially non-metallic bond, said bond being rendered adherent by fusion and heat treatment in situ.

35. Parts of a closure, united by a bond composed of organic material made adherent [illegible] heat treatment.

said bond being made adherent by fusion and continued heat treatment.

37. Parts of a closure united by a bond, said bond being made adherent by fusion and strongly adherent and solidified by continued heat treatment.

38. A sealed closure, including a glass section and a non-vitreous bond solidified in situ, said bond being composed of a heat-treated substance which is substantially harder, more adherent and has a higher fusion temperature than the untreated substance.

39. A sealed closure, including a glass section and a non-vitreous bond, said bond having a coefficient of expansion substantially equal to that of the glass section and having been rendered strongly adherent thereto by fusion and continued heat treatment in situ.

40. A seal, including an adherent bond solidified in situ and composed of a treated organic substance which melts at a temperature substantially higher than the original untreated substance.

41. A seal, including an adherent bond solidified in situ and composed of a heat-treated organic substance which has stronger adherence than the untreated substance.

42. A seal, including a non-vitreous bond composed of a mixture of a metallic organic salt and an organic exudate, said bond having been rendered adherent, hard and tenacious by fusion in situ.

43. A seal, including an adherent condensed bond solidified in situ and composed of a treated organic substance which fuses at a substantially higher temperature than the original untreated substance.

44. A composite article, including parts and an adherent matured organic bond solidified in situ and uniting and having a degree of elasticity approximating the difference between the elasticities of said parts.

45. A composite article, consisting of a plurality of parts and an intervening, matured, condensed and hardened organic substance solidified in situ and adherently secured to said parts.

46. A composite article, consisting of a plurality of vitreous parts and an intervening, matured, condensed and hardened organic substance solidified in situ and adherently secured to said parts.

47. A composite article, consisting of a plurality of parts and an intervening, matured, condensed and hardened derivative of an organic exudate solidified in situ and adherently secured to said parts.

48. A composite article, consisting of a plurality of vitreous parts and an intervening, matured, condensed and hardened shellac compound solidified in situ and adherently secured to said parts.

of the vessel being made from vitreous or frangible material.

24. A heat-insulated jacketed vessel, including an inner container and an outer jacket united by a fused, heat-treated organic bond, said outer jacket being composed of a plurality of dissimilar bonded parts.

25. A heat-insulated jacketed vessel, having an inner container and an outer jacket bonded to said container, said outer jacket being composed of a plurality of bonded vitreous parts, one of which is substantially coextensive with the inner container.

26. A heat-insulated jacketed vessel, having an inner container and an outer jacket, said jacket being formed in sections, and said sections having overlapping parts associated with an organic matured adherent, air-tight bond.

27. A heat-insulated jacketed vessel, having an inner container and an inherently stronger outer jacket, and an intervening adherent matured organic bond therefor solidified in situ.

28. A heat-insulated jacketed vessel, including an inner glass container and an outer glass jacket made from heavier material than said inner container, and an intervening matured bond solidified in situ.

29. A closure, adjacent parts of which are united by an adherent, non-vitreous, matured bond formed in situ by fusion.

30. A closure, having an unfused part thereof sustained by a non-vitreous matured bond formed in situ by fusion and adherently uniting said part to said closure.

31. An hermetically sealed closure, including a non-vitreous and substantially non-metallic matured bond of relatively low fusibility, said bond being rendered adherent by fusion in situ.

32. An hermetically sealed closure, including glass sections and a non-vitreous bond for said glass sections of lower fusibility than glass, said bond being composed of a material which is physically and permanently altered and rendered adherent by fusion in situ.

33. A hermetically sealed closure comprising a plurality of parts united by a non-vitreous bond, said bond being rendered adherent by fusion and heat treatment in situ.

34. A composite hermetically sealed closure, including a glass part thereof, said glass part being united to another part of said closure by a non-vitreous substantially non-metallic bond, said bond being rendered adherent by fusion and heat treatment in situ.

35. Parts of a closure, united by a bond composed of organic material made adherent by fusion and continued heat treatment.

36. Parts of a closure, united by a bond, and continued heat treatment.

37. Parts of a closure united by a [illegible] said bond being made adherent by [illegible] and strongly adherent and solidified by [illegible] tinued heat treatment.

38. A sealed closure, including a glass [illegible] tion and a non-vitreous bond solidified [illegible] situ, said bond being composed of a [illegible] treated substance which is substantial[illegible] harder, more adherent and has a higher [illegible] sion temperature than the untreated [illegible] stance.

39. A sealed closure, including a [illegible] section and a non-vitreous bond, said [illegible] having a coefficient of expansion substanti[illegible] ly equal to that of the glass section [illegible] having been rendered strongly adher[illegible] thereto by fusion and continued heat tre[illegible] ment in situ.

40. A seal, including an adherent [illegible] solidified in situ and composed of a tre[illegible] organic substance which melts at a tempe[illegible] ture substantially higher than the origi[illegible] untreated substance.

41. A seal, including an adherent [illegible] solidified in situ and composed of a [illegible] treated organic substance which [illegible] stronger adherence than the untreated [illegible] stance.

42. A seal, including a non-vitreous [illegible] composed of a mixture of a metallic org[illegible] salt and an organic exudate, said bond [illegible] ing been rendered adherent, hard and t[illegible] cious by fusion in situ.

43. A seal, including an adherent [illegible] densed bond solidified in situ and comp[illegible] of a treated organic substance which [illegible] at a substantially higher temperature [illegible] the original untreated substance.

44. A composite article, including [illegible] and an adherent matured organic bond [illegible] ified in situ and uniting and having a d[illegible] of elasticity approximating the differ[illegible] between the elasticities of said parts.

45. A composite article, consisting [illegible] plurality of parts and an intervening [illegible] tured, condensed and hardened organic [illegible] stance solidified in situ and adherently [illegible] cured to said parts.

46. A composite article, consisting [illegible] plurality of vitreous parts and an inter[illegible] ing, matured, condensed and harden[illegible] ganic substance solidified in situ and a[illegible] ently secured to said parts.

47. A composite article, consisting [illegible] plurality of parts and an interven[illegible] tured, condensed and hardened deri[illegible] an organic exudate solidified in situ [illegible] herently secured to said parts.

48. A composite article, cons[illegible] plurality of vitreous parts and a[illegible] ing, matured, condensed and ha[illegible] lac compound solidified in situ a[illegible] ly secured to said parts.

A composite article, consisting of a ...y of unfused parts, and an interven... ...ondensed and hardened organic bond of ...eat-conductivity fused to said unfused ...s and solidified in situ.

A composite article having a substan... ...y organic matured bond uniting parts ...of to form a seal, said bond being solidi... ...in situ and having a higher temperature ...sion than the organic material from ...ch the bond is produced.

A heat-insulated jacketed vessel, in... ...ing an inner container and an outer ...et having an open end, said inner con... ...er being of a vitreous or frangible ma... ...al and provided with a contracted open ... or neck, said inner container being her... ...ically sealed by a matured organic bond... ...material of low heat conductivity to the ...r jacket at a point adjacent its open end, ...material being solidified in situ.

A heat-insulated jacketed vessel, hav... ...an inner container and an outer jacket, ...of said parts having a flange and the ...r having a seat, and an adherent sub... ...tially organic matured bond solidified in ... for uniting said parts.

A heat-insulated jacketed vessel, hav... ...an inner container and an outer jacket, ...of said parts having a flange and the ...r having a seat, said seat being of greater ...eter than said flange, a ring supported ...id seat and underlying said flange, and ...dherent substantially organic bond for ...ing said container and jacket.

A heat-insulated jacketed vessel, hav... ...an inner container and an outer jacket, ...of said parts having a flange and the ...r having a seat, said seat being of greater ...eter than said flange, and a divided ring ...g upon said seat and underlying said ..., and an adherent substantially organic ... for uniting said container and jacket.

A heat-insulated vessel including an ...r container and an outer jacket united ...a intervening adherent bond, said bond ...solidified in situ and composed of a ma... ...organic material which has been ren... ...infusible by heat treatment.

A composite article including an or... ...bond, said bond being fused in situ ...eat-treated to render it infusible.

The combination with a heat-insulated ...d vessel, having a seal and a protect... ...readed ring therefor, of a cap for said ..., having a screw thread for engaging ...ring.

A heat-insulated receptacle of the type ... the body of the container is too ... to pass through the mouth of the ..., said receptacle including the plural ... multi-part jacket, a single-walled ...sible character having an ...

said neck, said protective element being supported by said jacket and having an external anchorage whereby a further element, such as a cap or a drinking cup, may be attached to said receptacle.

59. A heat-insulated jacketed vessel, having an inner container and a vitreous outer jacket bonded together by an intervening, organic, condensed and hardened bond solidified in situ, said jacket having a protecting cap permanently attached at its lower end.

60. A heat-insulated jacketed vessel, having an inner container and a vitreous outer jacket, said outer jacket being provided with a circumferential groove near the lower end thereof, and a non-vitreous cap for the bottom of said jacket engaging said groove.

61. A heat-insulated jacketed container, having a circumscribing reinforcement, the parts of which may act tensionally to resist expansive forces transmitted from within the container.

62. A heat-insulated jacketed vessel, having a vitreous inner container and an outer jacket, said inner container having circumscribing reinforcing elements exterior thereof.

63. A heat-insulated vessel, having an outer jacket and an inner container and a brace for the walls of said jacket and container, said brace being adherently bonded to said walls by a condensed and hardened organic substance.

64. A heat-insulated jacketed vessel, having an opaque single wall outer jacket and a diathermanous single wall, inner container, the outer surfaces of said jacket and container being reflective of heat rays.

65. A heat-insulated vessel including an outer jacket, an inner frangible container and an intervening bond, said bond being solidified in situ infusible at 212° F., insoluble in water, unaffected by weak acids or alkalis and impervious to air.

66. A heat-insulated vessel, having a porous part coated with a water-insoluble matured organic substance.

67. A heat-insulated vessel, having a nonmetallic and porous part coated with a water-insoluble matured organic substance.

68. The process of bonding parts of composite articles, which consists in heating a mass of organic exudate in situ between and in contact with said parts, to thereby change its character to render it strongly adherent to said parts.

69. The process of bonding parts of composite articles, which consists in heating a solution containing a fusible solute in situ between and in contact with parts of a composite article, to thereby evaporate the solvent and change the character of the solute to render it strongly adherent to said parts

composite article, consisting of a of unfused parts, and an intervensed and hardened organic bond of t-conductivity fused to said unfused d solidified in situ.

A composite article having a substanorganic matured bond uniting parts to form a seal, said bond being solidisitu and having a higher temperature ion than the organic material from the bond is produced.

A heat-insulated jacketed vessel, in- an inner container and an outer having an open end, said inner con- being of a vitreous or frangible maand provided with a contracted open neck, said inner container being herlly sealed by a matured organic bondterial of low heat conductivity to the acket at a point adjacent its open end, terial being solidified in situ.

A heat-insulated jacketed vessel, hav- inner container and an outer jacket, said parts having a flange and the having a seat, and an adherent subly organic matured bond solidified in uniting said parts.

A heat-insulated jacketed vessel, hav- inner container and an outer jacket, said parts having a flange and the aving a seat, said seat being of greater er than said flange, a ring supported seat and underlying said flange, and erent substantially organic bond for said container and jacket.

A heat-insulated jacketed vessel, hav- inner container and an outer jacket, said parts having a flange and the aving a seat, said seat being of greater er than said flange, and a divided ring upon said seat and underlying said and an adherent substantially organic or uniting said container and jacket.

A heat-insulated vessel including an container and an outer jacket united intervening adherent bond, said bond olidified in situ and composed of a maorganic material which has been reninfusible by heat treatment.

A composite article including an orbond, said bond being fused in situ t-treated to render it infusible.

The combination with a heat-insulated vessel, having a seal and a protectaded ring therefor, of a cap for said having a screw thread for engaging g.

A heat-insulated receptacle of the type the body of the container is too to pass through the mouth of the said receptacle including the plural a multi-part jacket, a single-walled r of frangible character having an ing neck, and a protective element ing and extending over the top of said neck, said protective element being supported by said jacket and having an external anchorage whereby a further element, such as a cap or a drinking cup, may be attached to said receptacle.

59. A heat-insulated jacketed vessel, having an inner container and a vitreous outer jacket bonded together by an intervening, organic, condensed and hardened bond solidified in situ, said jacket having a protecting cap permanently attached at its lower end.

60. A heat-insulated jacketed vessel, having an inner container and a vitreous outer jacket, said outer jacket being provided with a circumferential groove near the lower end thereof, and a non-vitreous cap for the bottom of said jacket engaging said groove.

61. A heat-insulated jacketed container, having a circumscribing reinforcement, the parts of which may act tensionally to resist expansive forces transmitted from within the container.

62. A heat-insulated jacketed vessel, having a vitreous inner container and an outer jacket, said inner container having circumscribing reinforcing elements exterior thereof.

63. A heat-insulated vessel, having an outer jacket and an inner container and a brace for the walls of said jacket and container, said brace being adherently bonded to said walls by a condensed and hardened organic substance.

64. A heat-insulated jacketed vessel, having an opaque single wall outer jacket and a diathermanous single wall, inner container, the outer surfaces of said jacket and container being reflective of heat rays.

65. A heat-insulated vessel including an outer jacket, an inner frangible container and an intervening bond, said bond being solidified in situ infusible at 212° F., insoluble in water, unaffected by weak acids or alkalis and impervious to air.

66. A heat-insulated vessel, having a porous part coated with a water-insoluble matured organic substance.

67. A heat-insulated vessel, having a nonmetallic and porous part coated with a water-insoluble matured organic substance.

68. The process of bonding parts of composite articles, which consists in heating a mass of organic exudate in situ between and in contact with said parts, to thereby change its character to render it strongly adherent to said parts.

69. The process of bonding parts of composite articles, which consists in heating a solution containing a fusible solute in situ between and in contact with parts of a composite article, to thereby evaporate the solvent and change the character of the solute to render it strongly adherent to said parts.

70. The process of bonding parts, which consists in causing a fluent, viscous, ma-

tured, organic substance to solidify in contact with said parts.

71. The process of bonding parts of composite articles, which consists in heating one of the parts, applying said part to a fusible bonding material, thereby causing some of said material to stick to said part, applying another part to the adhering mass, and heat-treating the mass until it becomes firmly adherent to both parts.

72. The process of producing a composite article, which consists in applying a mass of fusible indurated organic exudate in a heated atmosphere to adjacent parts thereof, heating the exudate to a temperature of fusion below the fusion temperature of said parts and so maturing the exudate by heat treatment as to increase its adherence.

73. The process of assembling and bonding the parts of an insulated receptacle, having a composite jacket, and a vitreous container capable of being inserted into a part of said jacket, which consists in arranging the container and a part of the jacket in concentric relation, bonding the container and said part together, uniformly heating said parts and said bond throughout, and then completing the outer jacket by securing a closure thereto.

74. The process of sealing the vacuum space of a vacuum vessel, which consists in withdrawing the air from said space through an opening, fusing a closure having a relatively low melting point, and causing the fused closure to become abnormally adherent by heat treatment to the unfused material at the opening.

75. The process of sealing the vacuum space of a vacuum vessel, which consists in withdrawing the air from said space through an opening in a glass wall of said vessel, fusing a closure having a relatively low melting point, and causing the fused closure to become abnormally adherent by heat treatment to the unfused glass at the opening.

76. The process of producing a closure which consists in heating a mass or organic exudate in contact with a body, to thereby change its character to render it strongly adherent to said body.

77. The process of joining parts of a composite article, which consists in subjecting an organic exudate which is in contact with said parts, to heat and fusing the same at a temperature at which said exudate becomes adherent and is rendered infusible at temperatures below the boiling point of water, and at which said parts remain substantially unaffected by the heat.

78. A heat-insulated vessel having walls united to each other by a fused cement which is solidified in situ and is infusible centric walls united to each other by fused heat-treated cement, being infusible at 212° F. and solidified in situ, said cement constituting the sole physical connection between said walls.

80. An insulated vessel having an inner container and an outer jacket, said inner container being united to said outer jacket by a heat insulating bonding material solidified in situ which is infusible at 212°

81. Bodies of solid material adherently united by a matured organic compound solidified in situ and, containing an organic exudate.

82. A heat-insulated vessel having a part coated with a water-insoluble matured organic substance to restrict the conductive properties of the part.

83. A seal including an adherent bond solidified in situ and composed of a treated organic substance which has a stronger adherence than the untreated substance, said bond being infusible at 500° F., and soluble in water, weak alkalis and alcohol and impervious to air.

84. A heat-insulated vessel including an inner container, an outer jacket, and an intervening bond solidified in situ and consisting of lac which has been matured by heat treatment.

85. A composite article consisting of a plurality of parts and an intervening adherent bond solidified in situ and consisting of lac which has been matured by heat treatment.

86. The process of bonding parts which consists in fusing lac in contact with parts and heat-treating the lac in situ to mature the bond.

87. The process of bonding parts which consists in fusing an organic material in situ between said parts, and heating the organic material until it solidifies and becomes infusible.

88. A heat-insulated vessel including an outer multi-part jacket and an inner container, said inner container having a portion too large to pass through the mouth of said jacket and having its inner surface of a nonporous nature, and an intervening adherent bond adapted to hermetically seal the space between said container and said jacket and to maintain said jacket in fixed relation to said container.

89. A heat-insulated vessel including an outer multi-part jacket and an inner container, said inner container having a portion too large to pass through the mouth of the jacket and having a non-porous surface and an intervening adherent heterogeneous bonding and sealing substance solidified in situ for maintaining said container in fixed relation to said outer

tured, organic substance to solidify in contact with said parts.

71. The process of bonding parts of composite articles, which consists in heating one of the parts, applying said part to a fusible bonding material, thereby causing some of said material to stick to said part, applying another part to the adhering mass, and heat-treating the mass until it becomes firmly adherent to both parts.

72. The process of producing a composite article, which consists in applying a mass of fusible indurated organic exudate in a heated atmosphere to adjacent parts thereof, heating the exudate to a temperature of fusion below the fusion temperature of said parts and so maturing the exudate by heat treatment as to increase its adherence.

73. The process of assembling and bonding the parts of an insulated receptacle, having a composite jacket, and a vitreous container capable of being inserted into a part of said jacket, which consists in arranging the container and a part of the jacket in concentric relation, bonding the container and said part together, uniformly heating said parts and said bond throughout, and then completing the outer jacket by securing a closure thereto.

74. The process of sealing the vacuum space of a vacuum vessel, which consists in withdrawing the air from said space through an opening, fusing a closure having a relatively low melting point, and causing the fused closure to become abnormally adherent by heat treatment to the unfused material at the opening.

75. The process of sealing the vacuum space of a vacuum vessel, which consists in withdrawing the air from said space through an opening in a glass wall of said vessel, fusing a closure having a relatively low melting point, and causing the fused closure to become abnormally adherent by heat treatment to the unfused glass at the opening.

76. The process of producing a closure which consists in heating a mass or organic exudate in contact with a body, to thereby change its character to render it strongly adherent to said body.

77. The process of joining parts of a composite article, which consists in subjecting an organic exudate which is in contact with said parts, to heat and fusing the same at a temperature at which said exudate becomes adherent and is rendered infusible at temperatures below the boiling point of water, and at which said parts remain substantially unaffected by the heat.

78. A heat-insulated vessel having walls united to each other by a fused cement which is solidified in situ and is infusible at 212° F.

79. A heat-insulated vessel having its concentric walls united to each other by fused heat-treated cement, being infu at 212° F. and solidified in situ, said ce constituting the sole physical connection tween said walls.

80. An insulated vessel having an in container and an outer jacket, said in container being united to said outer jac by a heat insulating bonding material lidified in situ which is infusible at 212°

81. Bodies of solid material adherent united by a matured organic compound lidified in situ and, containing an orga exudate.

82. A heat-insulated vessel having a p coated with a water-insoluble matured ganic substance to restrict the conduct properties of the part.

83. A seal including an adherent b solidified in situ and composed of a tre organic substance which has a stronger herence than the untreated substance, bond being infusible at 500° F., and soluble in water, weak alkalis and alco and impervious to air.

84. A heat-insulated vessel including inner container, an outer jacket, and an tervening bond solidified in situ and sisting of lac which has been matured heat treatment.

85. A composite article consisting o plurality of parts and an intervening herent bond solidified in situ and consis of lac which has been matured by heat t ment.

86. The process of bonding parts w consists in fusing lac in contact with parts and heat-treating the lac in situ mature the bond.

87. The process of bonding parts w consists in fusing an organic materia situ between said parts, and heating organic material until it solidifies and comes infusible.

88. A heat-insulated vessel includin outer multi-part jacket and an inner tainer, said inner container having a portion too large to pass through the of said jacket and having its inner face of a nonporous nature, and an vening adherent bond adapted to h ically seal the space between said con and said jacket and to maintain said in fixed relation to said container.

89. A heat-insulated vessel includi outer multi-part jacket and an inn tainer, said inner container having portion too large to pass through the of the jacket and having a non-poro face and an intervening adherent geneous bonding and sealing subst lidified in situ for maintaining said tainer in fixed relation to said outer

90. A heat-insulated vessel includ multi-part jacket, and a single-walled

e container adherently united by an ad-
onal and homogeneous mass of material
stituting a bond of sufficient elasticity
ompensate for unequal expansions and
tractions of said jacket and said con-
er due to varying thermal influences
hin and without said vessel.

. A heat-insulated receptacle including
acket, a single-walled container having
nner vitreous surface and an interven-
bond of dissimilar material solidified
itu and uniting said jacket and said
ainer at their upper ends, said bond
essing a degree of elasticity sufficient
ompensate for unequal expansions and
tractions of said ends due to varying
mal conditions within and without said
ptacle.

. A heat-insulated receptacle including
ulti-part jacket, a frangible container
arge to pass through the mouth of said
et and an intervening homogeneous bond-
and sealing substance solidified in situ
uniting said jacket to the container at
open end, said substance constituting
bstantial physical connection between
jacket and said container and possess-
a degree of elasticity sufficient to com-
ate for unequal expansions and con-
ions of said container and jacket at
open end due to varying thermal con-
ns within and without said receptacle.

. A heat-insulated vessel including a
i-part jacket, a single-walled frangible
ainer and an elastic adherent bond of
milar material solidified in situ and
ng said jacket and said container and
ted to compensate for unequal circum-
tial expansions and contractions there-
ue to thermal variations within and
out said vessel.

. A heat-insulated receptacle including
lti-part jacket, a container, consisting
material having low heat conductivity,
homogeneous bonding seal of dissimi-
aterial also having low heat conduc-
, said container having a body portion
rge to pass through the mouth of the
and being secured to and maintained
d jacket by said seal.

. A composite article having parts
to each other by a fused cement so-
d in situ and which is infusible at
egrees F.

An article of manufacture, consisting
art having a coating of a matured and
eated substance of organic nature
d in situ and adherently united
.

An article of manufacture, consisting
art having a coating of heat-treated
rmed in situ and adherently united

container having a body too large to pass through the mouth of said jacket and of frangible material, said container being spaced from said jacket, said jacket being formed in sections and having an inturned protective portion at its upper end extending over a part of said container, said protective portion being secured to said container by a mass of material hardened in situ.

99. A heat-insulated receptacle having a heavy-walled container of frangible material, a multi-part jacket, a protective collar of non-frangible material surrounding the upper extremity of and extending over said container, said collar being secured to said jacket, and non-conducting material solidified in position and sealing the space between the collar and the container, the body of said container being too large to pass through the mouth of said jacket.

100. A heat-insulated receptacle having a single-walled container of heavy frangible material, a multi-part jacket, and a screw-threaded collar having an inturned flange extending over a portion of said container and crimped to the upper portion of said outer jacket, said jacket having a closure secured to the lower end thereof.

101. A heat-insulated receptacle having a heavy-walled container of frangible material, a multi-part jacket, and a protective collar of non-frangible material surrounding the upper extremity of and extending over said container, said collar being secured to the container by an adherent and non-conducting mass deposited between said container and said collar, and said mass sealing the space between the container and the jacket at the upper extremity thereof.

102. A heat-insulated receptacle including a heavy single-walled frangible container, a composite outer jacket, and a bonding substance chemically altered in situ for uniting the upper portions of said container and said jacket.

103. A heat-insulated receptacle having an inner frangible container, a multi-part outer jacket having a mouth too small for said container to pass therethrough, and a bonding material solidified in situ, interposed between and adapted to unite the necks of said container and said jacket while the material of said container is maintained in an unfused condition, said bonding material constituting substantially the only means spanning and sealing the space between said necks, and operating to exclude air and to hold said container and said jacket in pre-determined spaced relation to each other.

104. The process of assembling the parts of a heat-insulated receptacle having a con-

container adherently united by an adonal and homogeneous mass of material stituting a bond of sufficient elasticity ompensate for unequal expansions and ractions of said jacket and said conr due to varying thermal influences in and without said vessel.

. A heat-insulated receptacle including cket, a single-walled container having nner vitreous surface and an intervenbond of dissimilar material solidified itu and uniting said jacket and said ainer at their upper ends, said bond essing a degree of elasticity sufficient ompensate for unequal expansions and ractions of said ends due to varying mal conditions within and without said ptacle.

. A heat-insulated receptacle including ulti-part jacket, a frangible container arge to pass through the mouth of said et and an intervening homogeneous bondand sealing substance solidified in situ uniting said jacket to the container at open end, said substance constituting bstantial physical connection between jacket and said container and possessa degree of elasticity sufficient to comate for unequal expansions and conions of said container and jacket at pen end due to varying thermal conns within and without said receptacle.

. A heat-insulated vessel including a i-part jacket, a single-walled frangible ainer and an elastic adherent bond of milar material solidified in situ and ng said jacket and said container and ted to compensate for unequal circumtial expansions and contractions thereue to thermal variations within and ut said vessel.

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. An article of manufacture, consisting art having a coating of a matured and reated substance of organic nature d in situ and adherently united .

. An article of manufacture, consisting art having a coating of heat-treated rmed in situ and adherently united

. heat-insulated receptacle including r jacket and a heavy-walled inner container having a body too large to pass through the mouth of said jacket and of frangible material, said container being spaced from said jacket, said jacket being formed in sections and having an inturned protective portion at its upper end extending over a part of said container, said protective portion being secured to said container by a mass of material hardened in situ.

99. A heat-insulated receptacle having a heavy-walled container of frangible material, a multi-part jacket, a protective collar of non-frangible material surrounding the upper extremity of and extending over said container, said collar being secured to said jacket, and non-conducting material solidified in position and sealing the space between the collar and the container, the body of said container being too large to pass through the mouth of said jacket.

100. A heat-insulated receptacle having a single-walled container of heavy frangible material, a multi-part jacket, and a screw-threaded collar having an inturned flange extending over a portion of said container and crimped to the upper portion of said outer jacket, said jacket having a closure secured to the lower end thereof.

101. A heat-insulated receptacle having a heavy-walled container of frangible material, a multi-part jacket, and a protective collar of non-frangible material surrounding the upper extremity of and extending over said container, said collar being secured to the container by an adherent and non-conducting mass deposited between said container and said collar, and said mass sealing the space between the container and the jacket at the upper extremity thereof.

102. A heat-insulated receptacle including a heavy single-walled frangible container, a composite outer jacket, and a bonding substance chemically altered in situ for uniting the upper portions of said container and said jacket.

103. A heat-insulated receptacle having an inner frangible container, a multi-part outer jacket having a mouth too small for said container to pass therethrough, and a bonding material solidified in situ, interposed between and adapted to unite the necks of said container and said jacket while the material of said container is maintained in an unfused condition, said bonding material constituting substantially the only means spanning and sealing the space between said necks, and operating to exclude air and to hold said container and said jacket in pre-determined spaced relation to each other.

104. The process of assembling the parts of a heat-insulated receptacle having a container provided with a neck, and a multi-part jacket the upper part of which has a

neck carrying an inturned flange at its top, which consists in introducing the container into the upper part of said jacket until it is arrested by said flange, employing means for arranging said container and said upper part of the jacket in concentric relation, joining said parts together by a material which is solidified in situ, and, finally, uniting the parts of the jacket to thereby enclose said container within them.

105. A heat-insulated receptacle having a single heavy-walled frangible container provided with an external annular shoulder, proximate its upper extremity, and a multi-part jacket provided with a part having an inturned flange extending over and engaging the shoulder of said container.

106. A heat-insulated receptacle including a jacket, a single-walled pendent container within said jacket, and a ring situated at the top of said jacket and extending from a portion of said jacket over a portion of said container, said ring being provided with external means to engage and interlock with an inverted drinking cup.

107. A heat-insulated receptacle of the type wherein the substantial means of sustention is at the top of the receptacle and the receptacle is of the kind wherein the body of the container is too large to pass through the mouth of the jacket, said receptacle including a multi-part jacket, a heavy single-walled container having a vitreous inner surface and having a neck concentrically arranged within the neck of said jacket, and a mass of material fixedly held between said necks and of sufficient strength to substantially maintain the normal relations of the jacket and the container, said mass of material being hardened in situ and constituting means for preventing vertical movements of the container, and the body of the jacket being heat-insulated from the body of the container.

108. A heat-insulated receptacle of the type in which the container is a permanent part, said receptacle including a multi-part jacket, and a heavy single-walled frangible container provided with a neck having an irregular outer surface by means of which said container is pendently supported within said jacket from an anchorage with which said receptacle is provided and the body of said container being too large to pass through the mouth of the jacket.

100. A heat-insulated receptacle of the kind wherein the container is of the heavy single-walled frangible type and the body is too large to pass through the mouth of the jacket, said receptacle including a jacket having a neck provided with internal irregularities, material disposed within said neck and engaging said irregularities, and

vided with external irregularities rec
said material.

110. A heat-insulated receptacle of
type wherein the body of the contai
too large to pass through the mouth
jacket, said receptacle including a multi
jacket, a single-walled frangible pe
container spaced at its neck from the
of said jacket, material hardened in sit
disposed between said necks and means
ciated and cooperating with said ma
for preventing vertical movements of
container.

111. A heat-insulated receptacle of
type wherein the body of the contai
too large to pass through the mouth
jacket, said receptacle including a multi
jacket provided with a neck having
regular inner surface proximate its
frangible single-walled container an
terial hardened in situ, disposed with
neck, conforming to the irregularities
of, and closing the space between sai
and the adjacent part of the container
container being supported in said jac
the upper end thereof and being
from said jacket at its sides and bott

112. A heat-insulated receptacle
type wherein the body of the contai
too large to pass through the mouth
jacket, said receptacle including a mult
jacket, a single-walled frangible co
and material extending across the sp
tween the necks of said jacket and sa
tainer, the neck of said container havi
irregular outer surface conforming
inner surface of said material, and th
ing in the device an inturned flange
ing over said material to prevent r
vertical movements of the jacket a
container.

113. A heat-insulated receptacle
type wherein the body of the conta
too large to pass through the mouth
jacket, said receptacle including a mu
jacket, a single-walled frangible co
said container having an irregular
proximate its top, a screw-threaded
part for engaging a drinking cup, a
tending over a portion of the neck
container, and material closing the s
tween the necks of the jacket and
tainer and cooperating with said f
prevent relative vertical movement
said jacket and said container.

114. A heat insulated receptacle
type wherein the body of the co
too large to pass through the mou
jacket, said receptacle having a
including a single-walled container
gible material, having an irregu
surface near its top, a multi-part j
ing near its top an irregular inner

neck carrying an inturned flange at its top, which consists in introducing the container into the upper part of said jacket until it is arrested by said flange, employing means for arranging said container and said upper part of the jacket in concentric relation, joining said parts together by a material which is solidified in situ, and, finally, uniting the parts of the jacket to thereby enclose said container within them.

105. A heat-insulated receptacle having a single heavy-walled frangible container provided with an external annular shoulder, proximate its upper extremity, and a multi-part jacket provided with a part having an inturned flange extending over and engaging the shoulder of said container.

106. A heat-insulated receptacle including a jacket, a single-walled pendent container within said jacket, and a ring situated at the top of said jacket and extending from a portion of said jacket over a portion of said container, said ring being provided with external means to engage and interlock with an inverted drinking cup.

107. A heat-insulated receptacle of the type wherein the substantial means of sustention is at the top of the receptacle and the receptacle is of the kind wherein the body of the container is too large to pass through the mouth of the jacket, said receptacle including a multi-part jacket, a heavy single-walled container having a vitreous inner surface and having a neck concentrically arranged within the neck of said jacket, and a mass of material fixedly held between said necks and of sufficient strength to substantially maintain the normal relations of the jacket and the container, said mass of material being hardened in situ and constituting means for preventing vertical movements of the container, and the body of the jacket being heat-insulated from the body of the container.

108. A heat-insulated receptacle of the type in which the container is a permanent part, said receptacle including a multi-part jacket, and a heavy single-walled frangible container provided with a neck having an irregular outer surface by means of which said container is pendently supported within said jacket from an anchorage with which said receptacle is provided and the body of said container being too large to pass through the mouth of the jacket.

109. A heat-insulated receptacle of the kind wherein the container is of the heavy single-walled frangible type and the body is too large to pass through the mouth of the jacket, said receptacle including a jacket having a neck provided with internal irregularities, material disposed within said neck and engaging said irregularities, and a container pendently supported within said jacket and having a neck that is provided with external irregularities rec[eiving] said material.

110. A heat-insulated receptacle of [the] type wherein the body of the contain[er] too large to pass through the mouth [of] jacket, said receptacle including a multi[-part] jacket, a single-walled frangible [con]tainer spaced at its neck from the [in]ner of said jacket, material hardened in situ [and] disposed between said necks and means [asso]ciated and cooperating with said mat[erial] for preventing vertical movements of [the] container.

111. A heat-insulated receptacle of [the] type wherein the body of the contain[er] too large to pass through the mouth [of] jacket, said receptacle including a multi[-part] jacket provided with a neck having [an] regular inner surface proximate its [up]frangible single-walled container and [ma]terial hardened in situ, disposed within [the] neck, conforming to the irregularities [of] of, and closing the space between said [neck] and the adjacent part of the container, [the] container being supported in said jacket [by] the upper end thereof and being [spaced] from said jacket at its sides and bottom.

112. A heat-insulated receptacle of [the] type wherein the body of the contain[er] too large to pass through the mouth [of] jacket, said receptacle including a multi[-part] jacket, a single-walled frangible [con]tainer and material extending across the space between the necks of said jacket and said container, the neck of said container having an irregular outer surface conforming to the inner surface of said material, and the device in the device an inturned flange extending over said material to prevent relative vertical movements of the jacket and container.

113. A heat-insulated receptacle of [the] type wherein the body of the contain[er] too large to pass through the mouth [of] jacket, said receptacle including a multi[-part] jacket, a single-walled frangible [con]tainer said container having an irregular [outer] surface proximate its top, a screw-threaded [neck] part for engaging a drinking cup, an [inturned] flange extending over a portion of the neck of the container, and material closing the space between the necks of the jacket and the container and cooperating with said flange to prevent relative vertical movements of said jacket and said container.

114. A heat insulated receptacle of [the] type wherein the body of the container is too large to pass through the mouth of the jacket, said receptacle having a neck including a single-walled container of frangible material, having an irregular outer surface near its top, a multi-part jacket having near its top an irregular inner surface and material conforming to the irregularities of the outer surface of the container

inner surface of the jacket and closing pace and establishing a relatively fixed ion between the necks of said container said jacket.

A heat-insulated receptacle of the wherein the body of the container is arge to pass through the mouth of the et, said receptacle including a multi-part et, a container having a vitreous inner ace, said container being spaced from jacket, material closing the space there-een, and overlapping elements one of h extends from said jacket inward, and other of which extends from said con-er outward, for sustaining said contain-om its upper end in concentric relation id jacket.

16. A heat-insulated receptacle of the wherein the body of the container is large to pass through the mouth of the et, said receptacle including a multi-jacket, a single-walled container hav-a vitreous inner surface, said container g spaced from said outer jacket, mate-closing the space there-between, and r-lapping elements one of which extends m said jacket inward, and the other of ch extends from said container outward, cooperating with the material to sus-said container from its upper end in centric relation to said jacket.

17. A heat-insulated receptacle of the wherein the body of the container is large to pass through the mouth of the et, said receptacle including a multi-jacket having a portion capable of act-as a seat, a single-walled container having a non-porous and vitreous inner surface, a mass of material closing the entrance to the space between said jacket and said container, said space being heat insulated, and the construction being such that the weight of said container is sustained by said seat.

118. A heat-insulated receptacle of the type wherein the body of the container is too large to pass through the mouth of the jacket, said receptacle having a cavity for the reception of hot or cold liquids or solids, a multi-part jacket, a heat-insulating space in part bounded by the wall of said jacket, and a single frangible wall separating said cavity from said heat-insulating space and terminating in an up-standing neck, said receptacle also including means supported by said jacket and surrounding and extending over said neck and constituting a protection therefor, said means having an external anchorage whereby a further element, such as a cap or a drinking cup, may be attached to said receptacle.

119. A heat-insulated receptacle having a container and a jacket, one of said parts having a flange and the other a seat, said seat being of greater diameter than said flange, and a ring supported by said seat and underlying said flange.

In testimony whereof, we affix our signatures.

WILLIAM W. SIMONSON.
LEWIS VD. BLAIR.

Witnesses:
CHARLES E. BULTENCLAM,
HARRY E. INALL.

88 DEFENDANT'S EXHIBIT 5-S.

French Patent No. 403,574.

Insulating Envelop for Bottles

The Company: Primas-Gesellschaft Ritzhaupt & Co residing in Germany.

pplication filed June 1, 1909. Delivered September 27, 1909.

Published November 8, 1909.

The present invention has as its object a device for keeping everages in bottles hot or cold for a certain length of time hich has the advantage over other bottles used for the same urpose of much greater strength and much less cost.

In the accompanying drawing two forms of embodiment of e object of the invention are illustrated by way of example:

Fig. 1 is a section of a bottle placed into an insulating velop;

Fig. 2 is a section of an insulating envelop from which the ttle may be removed at will.

The form of embodiment according to Fig. 1 will first be scribed.

A bottle 1, of a known type, of glass, aluminum, etc., is surnded on its outer surface up to the neck, as well as on the ttom, by a relatively thick layer of insulating material 2, h as corrugated cardboard, char-coal, cork waste, asbestos, waste etc. This layer 2 is surrounded by an envelope 3 sheet metal which may be varnished or polished on the side. The bottom of the bottle 1 is supported by a crossm 4 secured to the bottom of the envelop 3. The remainder the equipment of the bottle may be of any kind and the elop 3 may, for instance, be equipped with a handle 5. bottle is closed by a stopper 6 or by any other suitable ure.

he enumerated insulating materials are very bad heat ductors per se. The majority of these materials, particularly the corrugated card board, form empty spaces which inclose layers of air which also act as insulators. The liquids kept in the bottle can be preserved hot for a long time. Besides, the insulating layer, in combination the sheet metal envelope, constitutes a very effective ection for the bottle against all impacts or shocks. Such

a bottle can, therefore, be used even in places where it is not always possible to handle it carefully, for instance for the army and tourists.

The second form of embodiment which is illustrated in Fig. 2 is particularly destined to serve as a heat retaining envelop for nursing bottles. The milk can be kept warm for at least two to three hours in the nursing bottles enclosed in this envelop. The heat retaining envelope is provided with a support for the nipple which prevents, on one hand, the folding of the nipple while the infant sucks and which, on the other hand, prevents that the infant take the entire nipple in its mouth. This nipple-support permits the infant to suck without surveillance which is otherwise absolutely necessary, and it facilitates, consequently, the care to be given to small children considerably.

The new heat retaining envelope consists of a bottom *a* and of an upper part *b*. The bottom *a* carries a threaded fitting fitting *c* which may be screwed into a corresponding threaded portion of the upper part *b*. The two parts are so dimensioned that the bottle to be used just find its place therein when the two parts *a* and *b* are screwed together. The two parts of the heat retaining envelope, *a* and *b*, have double walls and the space between the two walls is filled with an insulating material, such as was described for the first form of embodiment.

The neck of the nursing bottle *d* may be passed through a corresponding aperture of the upper part *a* and the shoulders of the nursing bottle then comes to lie intimately against the correspondingly arched upper portion of the part *b*. The neck of the part *b* is provided externally with a threaded portion on which is screwed a nipple-carrier *e* made of a
490 suitable material such as porcelain, bone, celluloid, precious metal, ebonite (hard rubber), etc. This nipple-carrier *e* has a hollow truncated cone shape and is a little shorter than the nipple of rubber *f* which is mounted on the nursing bottle on which it is suitably adjusted.

The nipple, therefore, slightly exceeds the nipple carrier *e*, for instance by 1 centimeter. The length of the protruding end of the nipple may be regulated by screwing the nipple carrier more or less far down.

Résumé:

1. This insulating envelop for bottles is characterized by the feature that the bottle which may be equipped with a

stopper or a nipple carrier, is surrounded by an insulating layer which itself is encased.

2. The insulating envelope is composed of two parts which may be screwed one to the other, *i. e.* of a bottom and an upper part which have double walls and are filled with an insulating material.

3. The upper part of the envelop carries a screwed nipple-carrier through which passes the nipple of the nursing bottle which is enclosed in the envelop.

Primas-Gesellschaft Ritzhaupt & C°

Fig. 1

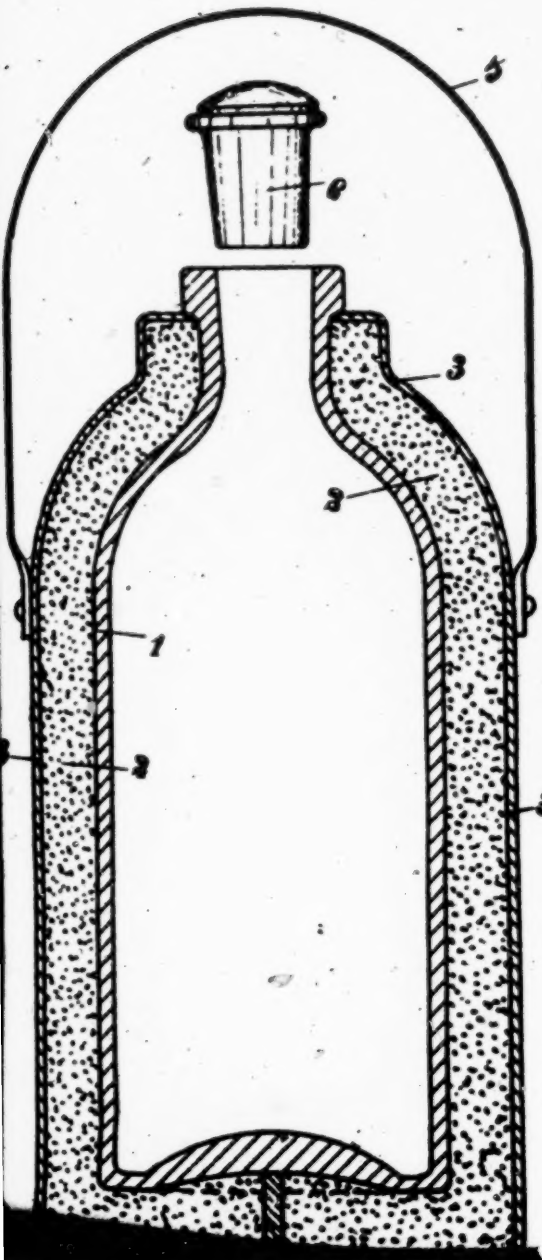
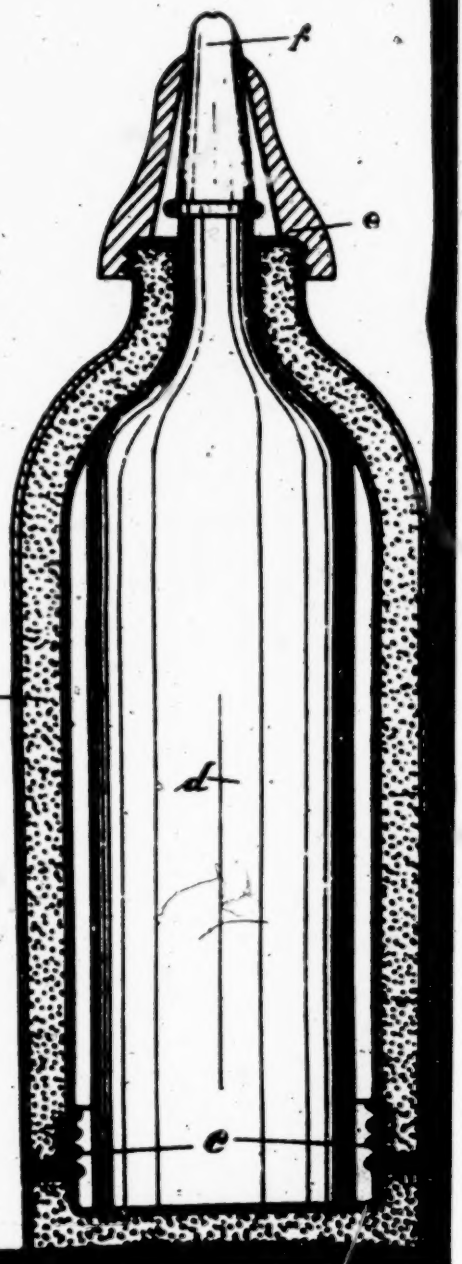


Fig. 2



494 French Patent No. 411,568.

Device of Protective and Insulating Envelop for Receptacles of Glass.

Jérôme Lodo and Xavier Gassend residing in France (Bouches-du-Rhône).

Application filed January 10, 1910. Delivered April 14, 1910. Published June 20, 1910.

The present invention has as its object an envelop destined for fragile receptacles such as carboys, retorts, cylinders etc., of glass, to preserve them from exterior shocks and to make their handling more convenient. Besides, the device adopted protects the merchandise transported therein against sudden variations of temperature which may be of importance in many cases.

In order that this invention may be well understood and only by way of example, a drawing is attached to this specification, in which:

Figs. 1 and 5 represent the device applied to a cylindrical flask.

Figs. 2 and 3, the same device applied to a demijohn.

Fig. 4, a safety closure.

The envelop is composed of a body 6 of metal or fibre board, suitably reinforced at the proper places and clasped following a line of generation. This body assumes a shape adapted to the flask which it is to contain (Figs. 1 and 2). It terminates, at the base, in a bottom 7, clasped, and at the upper part in a tapering cap 8. This cap is perforated with holes 9 which permit to observe the level of the liquid during filling.

A hoop 10 located at the base of the body 6 keeps the bottom 7 spaced from the ground and thus eliminates the shocks when the apparatus is placed on the ground.

Bails 11-11 and a handle 12 (Fig. 2) are provided to facilitate handling.

Inside is placed the receptacle 13 (of glass) that is to
495 be protected; it is separated from the outer envelope by a layer of triturated cork 14 which fills up all the spaces and which is retained by a closure also of cork, 15, placed on top.

A stirrup with four branches, 16, (Fig. 4) may be placed over the neck to prevent fraud in filling; this stirrup can only be removed by breaking the safety seals 17.

The triturated cork is an excellent heat insulator and, as such, retards all rapid heat exchanges between the inside and outside; it therefore acts as a shock absorber and as heat insulator.

Résumé.

The device of protective and insulating envelop for glass receptacles is characterized by:

1. A rigid envelop, of metal or not, composed of several parts assembled together, equipped with sights for observing the level of the liquid and with handles for handling.
2. An elastic insulating body, in powder or small pieces, interposed between the envelop and the receptable to be protected.
3. The combination of these two elements, with a view to protecting the receptacle against external shocks in the course of handling, transport etc.

Fig. 1.

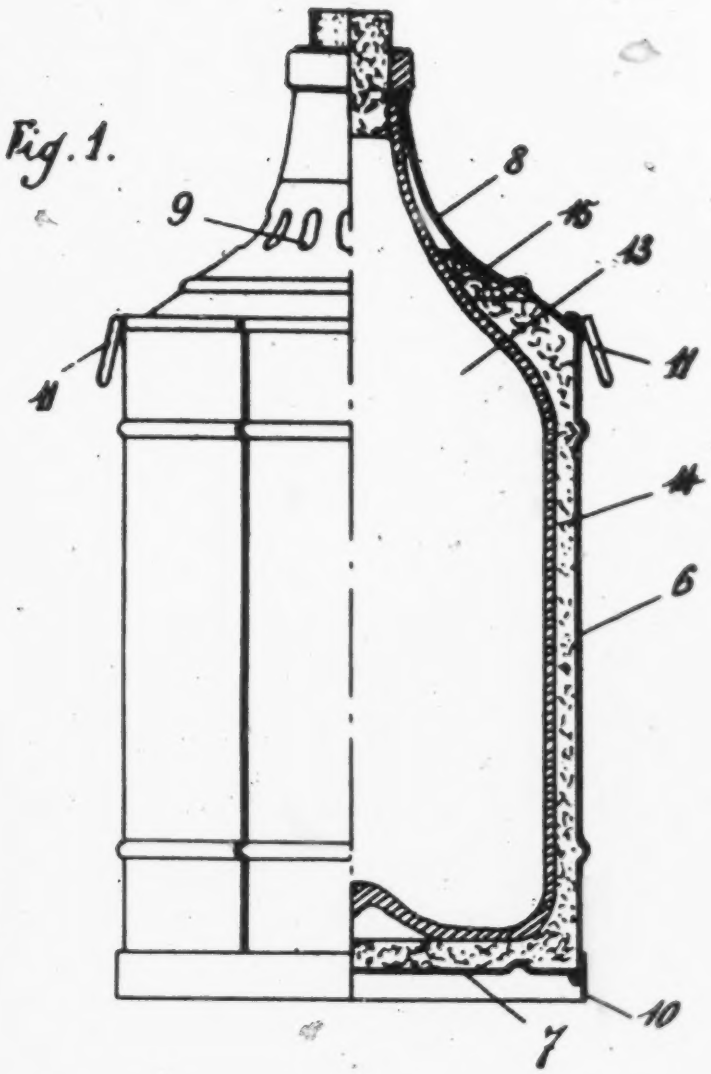


Fig. 2.

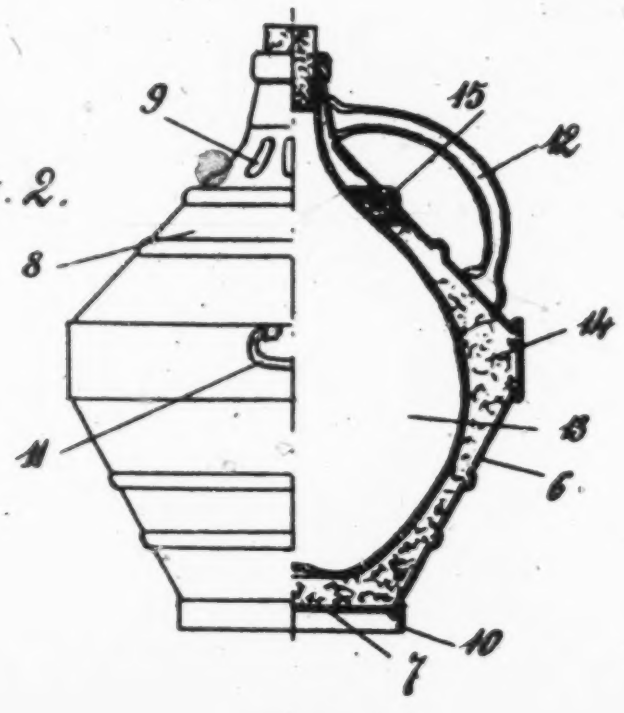


Fig. 3.

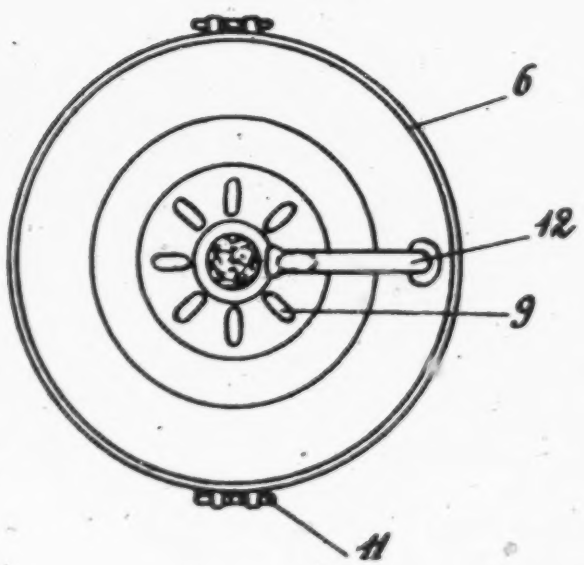


Fig. 5.

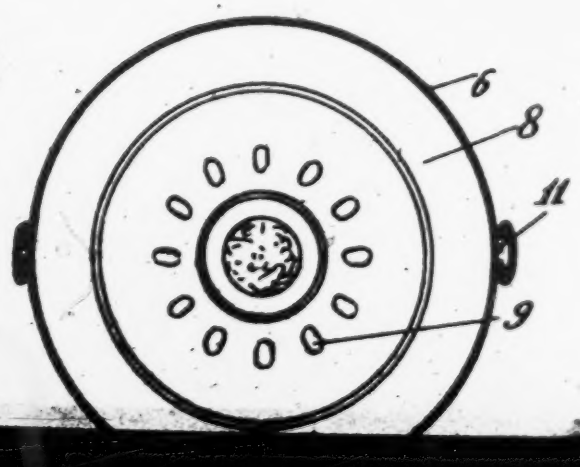


Fig. 4.



608 Northern District of Illinois } ss:
Eastern Division }

I, Charles M. Bates, Clerk of the District Court of the United States for the Northern District of Illinois, do hereby certify the above and foregoing to be a true and complete transcript of the proceedings had of record made in accordance with Praecipe filed in this Court in the cause entitled The Mantle Lamp Company of America, a corporation, *vs.* Aluminum Products Company, a corporation, No. 12,573, as the same appear from the original records and files thereof now remaining in my custody and control.

In Testimony Whereof, I have hereunto set my hand and affixed the seal of said Court at my office, in the City of Chicago, in said District, this 28th day of December, A. D. 1934.

CHARLES M. BATES

(Seal) *Clerk.*

609 UNITED STATES CIRCUIT COURT OF APPEALS

For the Seventh Circuit.

United States of America } ss.
Seventh Judicial Circuit. }

United States of America to the defendant, Aluminum Products Company, a corporation, Greeting:

You Are Hereby Cited and Admonished to be and appear in the United States Circuit Court of Appeals, Seventh Circuit, to be holden in the United States Court House in the City of Chicago, County of Cook and State of Illinois, within thirty (30) days from the date hereof, pursuant to the petition for appeal filed in the Clerk's Office of the District Court of the United States for the Northern District of Illinois, Eastern Division, wherein The Mantle Lamp Company of America is Appellant and you are Appellee, to show cause, if any there be, why the decree entered against the said Appellant as in the said appeal mentioned, should not be corrected and why justice should not be done to the parties in that behalf.

Given under my hand in the City of Chicago in the District and Circuit aforesaid, this 21st day of August, A. D. 1934 and of the independence of the United States of America the one hundred and fifty-ninth.

CHARLES E. WOODWARD
District Judge.

Service of the above citation acknowledged this 29th day of August, A. D. 1934.

CROMWELL, GREIST & WARDEN
WM. NEVARRE CROMWELL
Attorneys for Aluminum Products Company.

610 Endorsed: In the District Court of the United States • • • (Caption) • • • Citation to Circuit Court of Appeals, Seventh Circuit. Filed Aug. 29, 1934, Charles M. Bates, Clerk. George I. Haight, Lawyer, 209 S. La Salle St., Chicago, and W. H. F. Millar, Lawyer, First National Bank Building, Chicago. Telephone Randolph 0996.

UNITED STATES CIRCUIT COURT OF APPEALS

For the Seventh Circuit.

I, Frederick G. Campbell, Clerk of the United States Circuit Court of Appeals for the Seventh Circuit, do hereby certify that the foregoing Printed pages, numbered from 1 to 478, inclusive, contain a true copy of the printed record, under my supervision and filed on the sixth day of February, 1935, upon which the following entitled cause was heard and determined:

The Mantle Lamp Company of America,
Appellant,

vs.

Aluminum Products Company,
Appellee,

No. 5412, October Term, 1936, as the same remains upon the files and records of the United States Circuit Court of Appeals for the Seventh Circuit.

In Testimony Whereof I hereunto subscribe my name and affix the seal of said United States Circuit Court of Appeals for the Seventh Circuit, at the City of Chicago, this 3rd day of February, A. D. 1937.

(Seal)

FREDERICK G. CAMPBELL,
Clerk of the United States Circuit Court of Appeals for the Seventh Circuit.

At a regular term of the United States Circuit Court of Appeals for the Seventh Circuit, begun and held in the United States Court Room, in the City of Chicago, in said Seventh Circuit, on the second day of October, 1934, of the October Term, in the year of our Lord one thousand nine hundred and thirty-four, and of our Independence the one hundred and fifty-ninth.

The Mantle Lamp Company of America, *vs.* Aluminum Products Company.	Appeal from the District Court of the United States for the Northern District of Illinois, Eastern Division.

5412

And, to-wit: On the twenty-ninth day of December, 1934, there was filed in the office of the Clerk of this court, an appearance of counsel for appellant, which said appearance is in the words and figures following, to-wit:

UNITED STATES CIRCUIT COURT OF APPEALS

For the Seventh Circuit.

No. 5412. October Term 1934.

The Mantle Lamp Company of America,

vs.

Aluminum Products Company.

The Clerk will enter our appearance as counsel for appellant.

GEORGE I. HAIGHT,
209 So. La Salle St.,
MR. W. H. F. MILLAR,
38 So. Dearborn St.,
Chicago, Illinois.

Endorsed: Filed December 29, 1934. Frederick G. Campbell, Clerk.

And afterwards, to-wit: On the thirty-first day of December, 1934, there was filed in the office of the Clerk of this court, an appearance of counsel for appellee, which said appearance is in the words and figures following, to-wit:

UNITED STATES CIRCUIT COURT OF APPEALS

For the Seventh Circuit.

No. 5412. October Term 1934.

The Mantle Lamp Company of America,

vs.

Aluminum Products Company.

The Clerk will enter my appearance as counsel for appellee.

WM. NEVARRE CROMWELL,
38 So. Dearborn St.,
Chicago, Illinois.

Endorsed: Filed December 31, 1934. Frederick G. Campbell, Clerk.

And afterwards, to-wit: On the ninth day of April, 1935, the following further proceedings were had and entered of record, to-wit:

Tuesday, April 9, 1935.

Court met pursuant to adjournment.

Before:

Hon. Evan A. Evans, Circuit Judge.
Hon. Samuel Alschuler, Circuit Judge.
Hon. William M. Sparks, Circuit Judge.

The Mantle Lamp Company of America,
5412 *vs.*
Aluminum Products Company.

Appeal from the District Court of the United States for the Northern District of Illinois, Eastern Division.

It is ordered by the court that this cause be, and the same is hereby set down for hearing on Tuesday, May 28, 1935.

And afterwards, to-wit: On the twenty-eighth day of May, 1935, the following further proceedings were had and entered of record, to-wit:

Tuesday, May 28, 1935.

Court met pursuant to adjournment.

Before:

Hon. Evan A. Evans, Circuit Judge.
Hon. William M. Sparks, Circuit Judge.
Hon. Samuel Alschuler, Circuit Judge.

The Mantle Lamp Company of America,
5412 *vs.*
Aluminum Products Company.

Appeal from the District Court of the United States for the Northern District of Illinois, Eastern Division.

Now this day come the parties by their counsel and this cause now comes on to be heard on the printed record and briefs of counsel, and on oral arguments by Mr. George I. Haight, counsel for appellant, and by Mr. William Nevarre Cromwell, counsel for appellee, and the court having heard the same, takes this matter under advisement.

At a regular term of the United States Circuit Court of Appeals for the Seventh Circuit, begun and held in the United States Court Room, in the City of Chicago, in said Seventh Circuit, on the first day of October, 1935, of the October Term, in the year of our Lord one thousand nine hundred and thirty-five, and of our Independence the one hundred and sixtieth.

And afterwards, to-wit: On the thirtieth day of October, 1935, the following further proceedings were had and entered of record, to-wit:

Wednesday, October 30, 1935.

Court met pursuant to adjournment.

Before:

Hon. Evan A. Evans, Circuit Judge.
Hon. William M. Sparks, Circuit Judge.
Hon. Samuel Alschuler, Circuit Judge.

The Mantle Lamp Company of America, a corporation, *Appellant*,
5412 *vs.*
Aluminum Products Company, a corporation, *Appellee.*

Appeal from the District Court of the United States for the Northern District of Illinois, Eastern Division.

Upon hearing and consideration of this appeal there have arisen certain questions of law whereon this Court is in doubt and desires the instruction and advice of the Supreme Court of the United States.

The relevant facts out of which such legal questions grow are:

United States Letters Patent No. 1,435,199, for a heat-insulated receptacle, were issued November 14, 1922, to the Mantle Lamp Company of America, the appellant, assignee of Lewis Van Devanter Blair, upon Blair's application therefor filed October 29, 1919.

On November 21, 1932, appellant brought suit under said patent in the District Court of the United States for the Northern District of Illinois, Eastern Division, against the appellee herein. The bill of complaint charged appellee with infringement of the said Blair patent, and demanded relief by injunction and accounting. Appellee answered setting up, *inter alia*, prior suits by appellant in the same circuit wherein claims of the Blair patent had been found and decreed invalid, and that

> "9. The defendant further answering the bill of complaint avers that no disclaimer as required by the statutes of the United States has been made and/or filed in the United States Patent Office, in connection with Blair

Patent 1,435,199, as to claims 1, 4, 5, 6, 7, 10, 11, 12, 13, 14, 17, 18, 21, 22, 23 and 24 thereof which were held invalid by the United States Circuit Court of Appeals for the Seventh Circuit on May 28, 1927, in the case of *Macomb Mfg. Co.* v. *The Mantle Lamp Company of America,* Docket No. 3812, referred to in Section A of paragraph 8 hereof, and that because no disclaimer has been filed as aforesaid Blair Patent No. 1,435,199 is entirely invalid."

Upon hearing of the cause the District Court held and decreed claims 1, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 17, 18, 21, 22, 23 and 24, whereon appellant relied, to be invalid for various reasons, among them for neglect to file within reasonable time disclaimers of the said claims of this patent which had been, in prior suits, held to be invalid by the United States Circuit Court of Appeals for the Seventh Judicial Circuit,[1] and decreed dismissal of the bill for want of equity, from which decree the pending appeal was taken.

On July 8, 1924, this appellant brought suit against Macomb Manufacturing Company in the District Court of the United States for the Southern District of Illinois, charging that defendant with infringement of certain claims of the said Blair patent; and upon the hearing of the cause the court found the claims there in issue, viz., claims 1, 4, 5, 6, 7, 10, 11, 12, 13, 14, 17, 18, 21, 22, 23 and 24, to be valid and infringed, and entered a decree accordingly, from which decree an appeal was prayed and allowed to the United States Circuit Court of Appeals for the Seventh Judicial Circuit.

In a suit brought October 2, 1924, in the District Court of the United States for the Northern District of Illinois, Eastern Division, the appellant herein was a party, and the said Blair patent became involved by way of a counterclaim. The said District Court held the claims of the Blair patent there in suit, to wit, claims 1, 3, 4, 5, 6, 7, 10, 11, 12, 13, 14, 17, 18, 21, 22, 23 and 24, were valid and infringed and decreed ac-

[1] Among the District Court's findings of fact are:

"37. The present suit was commenced on November 21, 1932, or over five years after the judgments rendered in the Macomb and Monarch suits.

"38. No disclaimer has been filed to date, a period of over six years, by The Mantle Lamp Co. of America as to any of the claims held to be invalid in the Macomb and Monarch suits.

"39. This delay of over five years in instituting this suit and six years to date in filing disclaimers to the claims held invalid in the Macomb and Monarch suits is unreasonable within the meaning of the disclaimer statutes, Sections 65 and 71, Title 35 U. S. C. A."

Among the District Court's conclusions of law is:

"6. Each of the claims of the Blair Patent is invalid for unreasonable delay and neglect in filing disclaimers to invalid claims."

cordingly, from which decree an appeal was prayed and allowed to the United States Circuit Court of Appeals for the Seventh Judicial Circuit.

The two appeals last above referred to were co-pending in the United States Circuit Court of Appeals for the Seventh Judicial Circuit and were there heard together; and on May 28, 1927, the Court filed opinions in both of the appeals holding the enumerated claims of the said Blair patent therein respectively involved to be invalid, and adjuding and directing that the decrees therein be reversed, and ordering dismissal, for want of equity, of the bill of complaint in the first of those appeals and dismissal of the counterclaim in the second. 22 F. (2d) 93 and 95.

No petition for certiorari was filed in either cause, and on December 5, 1927, the said Circuit Court of Appeals issued mandates to the respective District Courts in the said causes, whereupon the bill of complaint in the one and the counterclaim in the other were promptly thereafter dismissed, and these causes, so far as they involved the said Blair patent, were finally concluded.

On July 28, 1924, appellant brought a suit on said Blair patent in the District Court of the United States for the Western District of Missouri against Cutino Company, a customer or jobber of Monarch Company, Incorporated, and on January 3, 1928, a bill was brought in the District Court of the United States for the Northern District of Illinois, Eastern Division, by Monarch Company, Incorporated, et al., to restrain the prosecution of the said suit in Missouri. A motion for temporary injunction having been denied, an appeal was taken to the United States Circuit Court of Appeals for the Seventh Judicial Circuit, in which Court, on October 2, 1928, the decree of the District Court was reversed and a temporary injunction was ordered restraining appellant from prosecuting any suit against any customers of the Monarch Company, Incorporated.

On September 12, 1928, appellant brought suit for infringement of said Blair patent against the George H. Bowman Company in the District Court of the United States for the Northern District of Ohio, and upon the hearing of said cause the claims there in issue, to wit, 1, 3, 4, 5, 6, 7, 9, 10, 11, 12, 13, 14, 17, 18, 21, 22, 23 and 24, were held invalid and the bill was ordered dismissed. An appeal was taken to the United States Circuit Court of Appeals for the Sixth Judicial Circuit, where, in an opinion filed November 3, 1931 (53 F.

(2d) 441), that Court reversed the District Court as to claim 1 of the Blair patent, finding it to be valid and infringed, without prejudice to the remaining claims in suit. This appellant petitioned the Supreme Court of the United States for writ of certiorari, based upon conflict of opinion and decision respecting said patent between the two Circuit Courts of Appeals, which petition was denied March 14, 1932. 285 U. S. 545.

The questions concerning which this Court desires the instruction and advice of the Supreme Court are:

1. Where certain but not all of the claims of patent are in suit, and all of the claims in suit are held and decreed to be invalid pursuant to a finding and judgment to that effect of the Circuit Court of Appeals of the circuit, may the owner of the patent maintain a suit afterward brought thereon in the same judicial circuit as that in which the first cause was decided, and against a different defendant not involved in the first suit—the second suit being based on the claims held in the prior suit to be invalid and on other claims of the same patent not previously adjudicated—where the owner of the patent wholly failed and omitted to file any disclaimer of the claims held in the first suit to be invalid, and where, between entry of decree of invalidity of the claims in the first suit and the bringing of the second suit in the same circuit, reasonable time had elapsed for filing such disclaimer?

2. If question 1 is answered in the affirmative, does the intervention of a period of approximately five years between the final judgment in the first suit and the institution in the same circuit of the second suit constitute delay so unreasonable as to bar the second suit for want of disclaimer of the claims which had been held to be invalid?

3. If question 2 is answered affirmatively, may the institution or pendency of other suits in another judicial circuit or circuits after entry of final decree in the first suit, based on claims of the patent so held invalid and on other claims thereof not previously adjudicated to be invalid, excuse the failure to file disclaimer of the claims held invalid prior to instituting the later suit in the same circuit?

The Clerk of this Court is directed to transmit to the United States Supreme Court a certified copy hereof.

Chicago, Illinois,
October 30, 1935.

And afterwards, to-wit: On the twenty-ninth day of April, 1936, there was filed in the office of the Clerk of this court, the Mandate of the Supreme Court of the United States, which said Mandate is in the words and figures following, to-wit:

United States of America, } ss.

The President of the United States of America, To the Honorable the Judges of the United States Circuit Court of Appeals for the Seventh Circuit, Greeting:

Whereas, lately in the United States Circuit Court of Appeals for the Seventh Circuit, in a cause between The Mantle Lamp Company of America, Appellant, and Aluminum Products Company, Appellee, No. 5412, wherein certain questions of law arose which were certified by the said Circuit Court of Appeals to the Supreme Court of the United States for its opinion; as by the inspection of the certificate of the Judges of the said United States Circuit Court of Appeals which was brought into the Supreme Court of the United States agreeably to the act of Congress, in such case made and provided, fully and at large appears.

And whereas, in the present term of October, in the year of our Lord one thousand nine hundred and thirty-five, the said cause came on to be heard before the said Supreme Court, on the said certificate, and was argued by counsel:

On consideration whereof, It is now here ordered by this Court that the certificate herein be, and the same is hereby, dismissed.

March 30, 1936.

You therefore, are hereby commanded that such proceedings be had in such cause, as according to right and justice, and the laws of the United States, ought to be had, the said certificate notwithstanding.

Witness, the Honorable Charles E. Hughes, Chief Justice of the United States, the twenty-seventh day of April, in the year of our Lord one thousand nine hundred and thirty-six.

CHARLES ELMORE CROPLEY,
Clerk of the Supreme Court of the United States.

Endorsed: Filed April 29, 1936. Frederick G. Campbell, Clerk.

And afterwards, to-wit: On the thirteenth day of May, 1936, there was filed in the office of the Clerk of this court, a Petition for further hearing, which said Petition is in the words and figures following, to-wit:

IN THE UNITED STATES CIRCUIT COURT OF APPEALS

For the Seventh Circuit.

No. 5412

The Mantle Lamp Company of America,
Appellant,
vs.
Aluminum Products Company,
Appellee.

PETITION.

Now comes the appellant in the above identified cause and represents to the Court that said cause was filed in this Court in the October Term, 1934, on appeal from the District Court of the United States for the Northern District of Illinois, Eastern Division; that briefs were filed and argument had; that under date of October 30, 1935, this Court certified three certain questions to the Supreme Court of the United States agreeably to the Act of Congress in such case made and provided; that the questions so certified deal with the applicability of the disclaimer statutes (Revised Statutes, Sec. 4197, Section 4922, 35 U. S. Code Sec. 65, Section 71) relating to patents and patent causes; that briefs were filed in the Supreme Court of the United States on behalf of the appellant and on behalf of the appellee and oral argument had; that on March 30, 1936, the Supreme Court rendered its opinion in the above entitled cause dismissing the certificate; and that on the 27th day of April, 1936, the Clerk of the Supreme Court of the United States issued the mandate of that Court dismissing the aforesaid certificate, which mandate was filed in this Court on April 28, 1936, copy of which is hereto attached marked Exhibit "A".

Wherefore the appellant moves that the above cause be set, if the Court desires it, for further argument upon the

question of the applicability of the disclaimer statutes identified above.

THE MANTLE LAMP COMPANY OF AMERICA,
By GEO. I. HAIGHT,
Its Counsel.

Exhibit A.

United States of America, } ss.

The President of the United States of America to the Honorable Judge of the United States Circuit Court of Appeals for the Seventh Circuit: Greeting:

Whereas, lately in the United States Circuit Court of Appeals for the Seventh Circuit, in a cause between The Mantle Lamp Company of America, Appellant, and Aluminum Products Company, Appellee, No. 5412, wherein certain questions of law arose which were certified by the said Circuit Court of Appeals to the Supreme Court of the United States for its opinion; as by the inspection of the certificate of the judges of the said United States Circuit Court of Appeals which was brought into the Supreme Court of the United States agreeably to the Act of Congress in such case made and provided, fully and at large appears.

And Whereas, in the present term of October, in the year of Our Lord 1935, the said cause came on to be heard before the said Supreme Court on the said certificate, and was argued by counsel:

On consideration whereof, It Is Now Here Ordered by this Court that the certificate herein be, and the same is hereby dismissed.

March 30, 1936

You, therefore, are hereby commanded that such proceedings be had in such cause, as according to right and justice and the laws of the United States, ought to be had, the said certificate notwithstanding.

Witness the Honorable Charles Evans Hughes, Chief Justice of the United States, the 27th day of April in the Year of Our Lord 1936.

(Signed) CHARLES ELMORE CROPLEY,
Clerk of the Supreme Court of the United States.

Endorsed: Filed May 13, 1936. Frederick G. Campbell, Clerk.

And afterwards, to-wit: On the eleventh day of June, 1936, the following further proceedings were had and entered of record, to-wit:

Thursday, June 11, 1936.

Court met pursuant to adjournment.

Before:

Hon. Evan A. Evans, Circuit Judge.
Hon. Williams M. Sparks, Circuit Judge.
Hon. Samuel Alschuler, Circuit Judge.

The Mantle Lamp Company of America,
5412 *vs.*
Aluminum Products Company.

Appeal from the District Court of the United States for the Northern District of Illinois, Eastern Division.

It is ordered by the court that the Order of May 28, 1935, taking this case under advisement be, and the same is hereby vacated; and it is further ordered that this cause be set down for re-argument at the next October Session of this court.

At a regular term of the United States Circuit Court of Appeals for the Seventh Circuit, begun and held in the United States Court Room in the City of Chicago, in said Seventh Circuit, on the sixth day of October, 1936, of the October Term, in the year of our Lord one thousand nine hundred and thirty-six, and of our Independence the one hundred and sixty-first.

And afterwards, to-wit: On the ninth day of November, 1936, the following further proceedings were had and entered of record, to-wit:

Monday, November 9, 1936.

Court met pursuant to adjournment.

Before:

Hon. Evan A. Evans, Circuit Judge.
Hon. William M. Sparks, Circuit Judge.
Hon. Walter C. Lindley, District Judge.

The Mantle Lamp Company of America,
5412 *vs.*
Aluminum Products Company.

Appeal from the District Court of the United States for the Northern District of Illinois, Eastern Division.

Now this day come the parties by their counsel and this cause now comes on to be heard on the printed record and briefs of counsel, and on oral argument by Mr. George I. Haight, Counsel for appellant, and by Mr. William Nevarre Cromwell, counsel for appellee, and the court having heard the same, takes this matter under advisement.

And afterwards, to-wit: On the twenty-eighth day of November, 1936, there was filed in the office of the Clerk of this court, the Opinion of the court, which said Opinion is in the words and figures following, to-wit:

IN THE UNITED STATES CIRCUIT COURT OF APPEALS

For the Seventh Circuit.

No. 5412. October Term and Session, 1936.

THE MANTLE LAMP COMPANY OF AMERICA,
Appellant,
vs.
ALUMINUM PRODUCTS COMPANY, a Corporation,
Appellee.

Appeal from the District Court of the United States for the Northern District of Illinois, Eastern Division.

November 28, 1936.

Before EVANS and SPARKS, *Circuit Judges,* and LINDLEY, *District Judge.*

SPARKS, *Circuit Judge.* Appellant sued appellee for infringement of patent No. 1,435,199, which was granted upon the application of Blair and issued to appellant, the assignee of the invention and application, on November 14, 1922. The defense was invalidity and non-infringement. The bill was dismissed for want of equity, and from that decree this appeal is prosecuted.

The validity of this patent was heretofore contested in this court in *Macomb Manufacturing Company* v. *The Mantle Lamp Company of America,* 22 F. (2d) 93, and in *Monarch Company, Inc.* v. *The Mantle Lamp Company of America,* 22 F. (2d) 95, and claims 1, 4, 5, 6, 7, 10, 11, 12, 13, 14, 17, 18, 21, 22, 23 and 24 were held invalid for lack of novelty.

Subsequently, appellant instituted a suit for infringement of the same patent, in Ohio, against the George H. Bowman Company. The defendant answered, asserting invalidity, and thereafter did not appear and was not represented. The District Court held the patents invalid on the authority of the Macomb and Monarch cases, *supra,* stating in its unpublished opinion, "• • as the latter were rendered on what I understand to be substantially the same evidence of lack of invention, which can be found in the record before me • • I regard myself bound to follow them." On appeal, the Court

of Appeals for the Sixth Circuit reversed the District Court and held claim 1 valid and infringed. In that appeal the appellee did not appear and was not represented.

The appellant thereupon sought certiorari in the Bowman case on the ground of a conflict of decision between the Sixth and Seventh Circuits. This was denied by the Supreme Court because the petitioner had been successful in the cause in which it sought certiorari.

There was a difference in the evidence submitted in the Bowman case and in the case at bar from that presented in the Macomb and Monarch cases. It consisted of the testimony of witnesses Brainard and Terry who did not testify in the last named cases.

Although the validity of this patent is a close question, we are not convinced that the additional testimony is sufficient to warrant us in departing from the former rulings of this court in the Macomb and Monarch cases.

Decree affirmed.

Endorsed: Filed November 28, 1936. Frederick G. Campbell, Clerk.

And on the same day, to-wit: On the twenty-eighth day of November, 1936, the following further proceedings were had and entered of record, to-wit:

Saturday, November 28, 1936.

Court met pursuant to adjournment.

Before:

Hon. Evan A. Evans, Circuit Judge.
Hon. William M. Sparks, Circuit Judge.
Hon. Walter C. Lindley, District Judge.

This cause came on to be heard on the transcript of the record, from the District Court of the United States for the Northern District of Illinois, Eastern Division, and was argued by counsel.

On Consideration Whereof, It is now here ordered, adjudged and decreed by this court that the Decree of the said District Court in this cause be, and the same is hereby affirmed with costs.

And afterwards, to-wit: On the twenty-second day of December, 1936, the Mandate of this court issued to the District Court of the United States for the Northern District of Illinois, Eastern Division.

And afterwards, to-wit: On the twenty-eighth day of December, 1936, there was filed in the office of the Clerk of this court, a Petition to Recall the Mandate, which said Petition is in the words and figures following, to-wit:

IN THE UNITED STATES CIRCUIT COURT OF APPEALS

For the Seventh Circuit.

No. 5412.

The Mantle Lamp Company of America,
Appellant,
vs.
Aluminum Products Company, a corporation,
Appellee.

PETITION TO RECALL MANDATE.

And now comes The Mantle Lamp Company of America, a corporation, Appellant in the above entitled cause, by George I. Haight and W. H. F. Millar, its attorneys, and respectfully prays that an order be entered by this Court in the above entitled cause, recalling the mandate in said cause and staying the re-issuance thereof until and including February 28, 1937 and thereafter until final disposition of said cause by the Supreme Court of the United States in case, on or before the said date, February 28, 1937, there shall be filed with clerk of this court the certificate of the clerk of the said Supreme Court as provided by the rules of this court, and in support of this motion the said Appellant represents unto the court as follows:

1. That on or about the 28th day of November, 1936, an order and judgment was entered by this court affirming the

judgment in said cause of the District Court of the United States for the Northern District of Illinois, Eastern Division.

2. That under the rules of this court the mandate in said cause issued on the 22nd day of December, 1936, the same being twenty-four days after the judgment of this court.

3. That Appellant intends to file in the Supreme Court of the United States, a petition for the writ of certiorari in this cause as provided by the statutes of the United States in such case made and provided, and in accordance with the rules of said Supreme Court of the United States and that Appellant intends to file said petition for the writ of certiorari in good faith and in accordance with the statutes and the rules of said Supreme Court hereinbefore mentioned.

4. That the judgment in this case is for costs only and that on the 29th day of August, A. D. 1934, Appellant filed its bond in the penal sum of Five Hundred Dollars ($500.00) with the United States Fidelity & Guaranty Company as surety, conditioned that if said Appellant should perfect its appeal to effect and answer all damages and costs if it failed to make the said plea good then the obligation should be void, otherwise to remain in full force and effect; which said appeal bond was approved by the Judge of the District Court of the United States for the Northern District of Illinois, Eastern Division, on the same date that it was filed and which said bond is still in full force and effect.

5. That in the opinion of the Appellant and its counsel, said bond already in force and effect is sufficiently full to protect the interest of the Appellee in said cause during the period of said stay order or any extension thereof as provided by the rules of this court.

Wherefore, this Appellant prays, as above set forth, that the mandate heretofore issued in this cause be recalled and the reissuance thereof stayed until and including the 28th day of February, 1937, and thereafter until the final disposition of said cause by the Supreme Court provided the certificate of the clerk of the Supreme Court is filed in the office of the clerk of this court in the manner and form and as prescribed by the rules of this honorable court. All of which is respectfully asked and prayed.

THE MANTLE LAMP COMPANY OF AMERICA,
By GEO. I. HAIGHT,
W. H. F. MILLAR.
Its Attorneys.

State of Illinois, } ss.
County of Cook. }

W. H. F. MILLAR upon oath says that he is one of the attorneys of record for the Appellant in the above entitled cause; that he served a copy of the above and foregoing motion upon Appellee by delivering a copy thereof to William Nevarre Cromwell, counsel for Appellee, on the 26th day of December, A. D. 1936.

W. H. F. MILLAR.

Subscribed and sworn to before me this 28th day of December, A. D. 1936.

FLORA E. CONNELL,
(Seal) *Notary Public.*

Endorsed: Filed December 28, 1936. Frederick G. Campbell, Clerk.

And afterwards, to-wit: On the thirtieth day of December, 1936, the following further proceedings were had and entered of record, to-wit:

Wednesday, December 30, 1936.

Court met pursuant to adjournment.

Before:

Hon. William M. Sparks, Circuit Judge.

The Mantle Lamp Company of America,
5412 *vs.*
Aluminum Products Company.

Appeal from the District Court of the United States for the Northern District of Illinois, Eastern Division.

Now this day comes counsel for appellant and presents a Petition to Recall and Stay the Mandate of this court pending a petition to the Supreme Court of the United States for a Writ of Certiorari.

On Consideration Whereof: It is now here ordered that the Mandate in this cause be, and the same is hereby recalled and stayed until the further order of this court.

It is further ordered that counsel for appellant proceed with diligence and promptly file the petition for a Writ of Certiorari in the Supreme Court of the United States, and forthwith file in this court proof of the filing of said petition in said court.

UNITED STATES CIRCUIT COURT OF APPEALS

For the Seventh Circuit.

I, Frederick G. Campbell, Clerk of the United States Circuit Court of Appeals for the Seventh Circuit, do hereby certify that the foregoing Printed pages, numbered from 481 to 497, inclusive, contain a true copy of the proceedings had and papers filed (excepting Briefs of counsel, and Stipulations and order extending time to file Briefs); in the case of

The Mantle Lamp Company of America,
Appellant,

vs.

Aluminum Products Company,
Appellee,

No. 5412, October Term, 1936, as the same remains upon the files and records of the United States Circuit Court of Appeals for the Seventh Circuit.

In Testimony Whereof I hereunto subscribe my name and affix the seal of said United States Circuit Court of Appeals for the Seventh Circuit, at the City of Chicago, this 3rd day of February, A. D. 1937.

(Seal)

FREDERICK G. CAMPBELL,
Clerk of the United States Circuit Court of Appeals for the Seventh Circuit.

SUPREME COURT OF THE UNITED STATES

ORDER ALLOWING CERTIORARI—Filed March 29, 1937

The petition herein for a writ of certiorari to the United States Circuit Court of Appeals for the Seventh Circuit is granted.

And it is further ordered that the duly certified copy of the transcript of the proceedings below which accompanied the petition shall be treated as though filed in response to